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TOBACCO in the UNITED STATES

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TOBACCO

in the

UNITED STATES

UNITED STATES DEPARTMENT OF AGRICULTURE

CONSUMER AND MARKETING SERVICE

Revised October 1966

P U R P O S E

This pamphlet has been compiled to fill a need for a brief but comprehensive description of the various phases of the tobacco industry. It is designed mainly for use of persons whose frequent requests indicate an interest in such overall type of information. The publication contains a minimum of statistics. For current statistical information, reference should be made to the latest editions of the Annual Report on Tobacco Statistics, published by the Consumer and Marketing Service, and the Tobacco Situation, published by the Economic Research Service.

The material has been taken primarily from the publications listed as "principal sources" in the bibliography, and brought to date as required. Some supplementary comments have been added, based on first-hand observations and experiences.

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PREFACE

Tobacco is a commodity that is of major importance to United States agriculture and business. It usually ranks fifth among field crops in cash receipts to farmers, and is fifth in value among agricultural export classifications. It is a major source of revenue for Federal, State, and local governments (receipts totaled over 3.3 billion dollars for the fiscal year 1964-65). About 2 percent of consumer expenditures goes for tobacco products (8.6 billion dollars in 1965).

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Prepared and arranged by Albert Doub, Jr., and Alice Wolfe, Tobacco Division, Consumer and Marketing Service.

TOBACCO IN THE UNITED STATES

HISTORICAL SKETCH

Tobacco is one of the products given to the world by the natives of the Americas. At the time of the discovery of America, Columbus found the natives using tobacco in the forms common today--smoking, chewing, and snuff. Early records show that they also understood the essential features of its production as it is now practiced, including the details of proper spacing in the field, topping and suckering the plants, and the distinctive drying processes, now known as air-curing, sun-curing, and fire-curing. Facts regarding the introduction of tobacco to the white race by the Indians, the attention given it in the literature of history, poetry, and romance, and its pervasive influence in the social and economic affairs of mankind have made this crop unique among the products of the soil.

The rapidity of the expansion of tobacco production over the world was phenomenal. By 1531, less than 40 years after the discovery of America, Spaniards were cultivating the crop commercially in the West Indies; by 1560, it was being grown in Europe as an ornamental plant and for its medicinal qualities; by 1580, its commercial culture had extended to Cuba and Venezuela, and by about 1600, to Brazil. By 1600 or 1605, mariners and traders had introduced it into China, Japan, South Africa, and many other countries.

History records that John Rolfe began the commercial culture of tobacco in the English colonies at Jamestown in 1612, and that in 1618, a shipment of 20,000 pounds was made to England. But tobacco from the Spanish settlements had come into use in Europe and the British Isles at least 20 years before the Virginia colony was founded, and this meant that at the outset the tobacco produced by the colonists was forced to meet the competition of the Spanish product in the export market. In spite of this, however, the growing of tobacco soon became general in the Virginia colony and production increased rapidly. It became the leading item of commerce with the mother country, for it was about the only commodity the settlers could produce to exchange for the many essential manufactured products needed from England.

From historical records of the era, we learn that tobacco was such a major factor in the economy of the colony at one time that John Rolfe was growing it in the streets of Jamestown, and that wives were bought and ministers paid with specified quantities of it.

In colonial days, the only market for tobacco was, of course, the export trade. In the seventeenth century, the usual method of marketing was to consign the tobacco, packed in hogsheads, to an English merchant, who sold it on a commission basis and supplied needed manufactured goods in return. This system proved generally unsatisfactory to the planter, both because of the delay involved in the transaction and the risk encountered in dealing with the often unscrupulous English merchants. During the course of the eighteenth century, another method of marketing came into general use, in which the crop was sold at the farm to a local British agent, who maintained a "store," where the planter might secure the manufactured items he needed. This system proved to be more satisfactory and became the most popular way of marketing.

It was not until after the close of the Revolutionary War that the use of tobacco in domestic manufacture first assumed importance in this country. At the present time, about 70 percent of a tobacco crop is used domestically in the production of cigars, cigarettes, and other forms of manufacture. Today, about 95 percent of the tobacco produced in the United States is sold to the highest bidder in the auction warehouses, bidders being mostly manufacturers and dealers who buy the leaf for use in the manufacture of the various products, or for export.

The tobacco in common use today is very much unlike that which the settlers found growing in the Indian villages along the James, Rappahannock, and other rivers of Tidewater Virginia. Most of this tobacco was a strong type belonging to the species Nicotinia rustica L., believed to have originated in Mexico. The English colonists learned of the milder and more aromatic varieties of the species Nicotinia tabacum L., which probably originated in Brazil, and in time they adopted this kind for their production.

The growing of tobacco in Maryland began in the 1630's, and during the eighteenth century, Virginia and Maryland grew the bulk of the country's crop. At the outbreak of the Revolutionary War, exports were about 100 million pounds, nearly all of which was produced in these two States. Soon after the War, culture was extended into Kentucky, Tennessee, Ohio, Missouri, and North Carolina. Today, it is grown commercially, in addition to these States, in South Carolina, Georgia, Florida, Alabama, Indiana, West Virginia, Pennsylvania, Connecticut, Massachusetts, Wisconsin, and Louisiana.

As tobacco culture was carried from the first settlement at Jamestown into new territory, it was seen that the changes in soil and climate caused important differences in the characteristics of the tobacco produced. Gradually, it became apparent that these differences in the properties of the tobacco leaf greatly affected its suitability for use in different manufactured forms. Through gradual evolution, tobacco culture has become highly specialized, each district producing a special type of leaf particularly adapted for certain uses: whether in cigarettes, cigars, smoking, or chewing tobacco. It has been found that special types of tobacco can be produced only under certain conditions of soil and climate, by using certain varieties, and by following special methods in growing and curing the crop.

From the beginning made by John Rolfe at Jamestown, tobacco production, marketing, and use have contributed important chapters in American agricultural history.

Currently about 600,000 farm families in the United States and Puerto Rico grow tobacco for sale. Total annual gross income to farmers from the crop is over a billion dollars; costs must be subtracted from the gross income to arrive at a net figure. Tobacco growing requires a great deal of labor. A farmer and his family (supplemented by some hired help) must put in about 400 man-hours of labor to raise one acre of tobacco. This may be contrasted to the average amount of labor - about 8 hours - needed to raise an acre of wheat. Tobacco farmers say there is a thirteenth month in their calendar year, called "Tobaccuary," made up of all the extra hours they have to work - before dawn and after dark - to produce a tobacco crop.

CLASSIFICATION

As many sorts of leaf are required for the manufacture of the various tobacco products, it is necessary that some standard system of classification be used for orderly marketing and distribution of the leaf from farmers to manufacturers and dealers. Six major classes are designated by the Department of Agriculture to cover tobaccos grown in the United States. Differences between classes result chiefly from variations in soils and climate, in cultural practices, and in curing methods. The first three classes are named on the basis of the method used in curing, and the last three, which are all cigar leaf kinds, on the basis of the principal use for which they are produced.

Tobaccos grown in the United States, along with the States in which they are grown, are listed below, according to the classification of the Department of Agriculture.

CLASSIFICATION OF TOBACCO GROWN IN THE UNITED STATES

Class	Type		States in which grown
1. Flue-cured	11(a)	Old Belt	Va. and N. C.
	11(b)	Middle Belt	N. C.
	12	Eastern Belt	N. C.
	13	Border Belt	S. C. and N. C.
	14	Georgia & Florida Belt	Ga., Fla., and Ala.
2. Fire-cured	21	Virginia	Va.
	22	Eastern District	Ky. and Tenn.
	23	Western District	Ky. and Tenn.
3. Air-cured (a) Light	31	Burley	Ky., Tenn., Ohio, Ind., Va., N. C., W. Va., Mo.
	32	Maryland Broadleaf	Md.
3. Air-cured (b) Dark	35	One Sucker	Ky. and Tenn.
	36	Green River	Ky.
	37	Virginia sun-cured	Va.
4. Cigar-filler	41	Pennsylvania Seedleaf	Pa.
	42-44	Ohio filler	Ohio
	46	Puerto Rican filler	Puerto Rico
5. Cigar-binder	51	Connecticut Broadleaf	Conn.
	52	Connecticut Havana Seed	Conn. and Mass.
	54	Southern Wisconsin	Wis.
	55	Northern Wisconsin	Wis.
6. Cigar-wrapper	61	Connecticut Shade	Conn. and Mass.
	62	Georgia & Florida Shade	Ga. and Fla.
7. Miscellaneous Domestic	72	Perique	La.

Each class is made up of two or more different types. Differences between types are found in color, body, leaf composition, and in the response to fermentation and aging. They result mainly from varying soil and climatic conditions, since the varieties and growing and curing methods for all types within a class are generally similar.

Each type is further subdivided into grades. These grades are related to stalk position, quality, color, body, and other characteristics. One type of tobacco may be subdivided into as many as 170 different grades. Manufacturers buy the various grades of the leaf according to the intended use in manufacture.

Leaves vary greatly in size. They range in length from about 12 to 30 inches, but most are from 20 to 24 inches long. The width is usually about one-half the length, varying according to the different types. Leaves of some kinds have sharp, pointed tips, and others have rounded ends.

Following is a brief description of the kinds of tobacco, covering some of the elements of quality, volume of production and exports, and principal uses.

Class I - Flue-cured makes up over 57 percent of the volume of tobacco grown in the United States today. Its name comes from the metal flues of the heating apparatus originally used in all curing barns. Its normal range is from yellow to reddish-orange in color, thin to medium in body, and mild in flavor.

Flue-cured tobacco is the principal export type, accounting for over 81 percent of the total leaf exported. Over one-third of the production is exported, or around 431 to 498 million pounds annually.

Most of the crop is used in cigarettes, both in the United states and in the importing countries. Cigarettes account for 95 percent of flue-cured usage in the United States, smoking and chewing tobaccos accounting for the remainder.

Figure 1.--Flue-cured plant. Growers normally break off the flower heads to allow for better development of the leaves.

Class 2 - Fire-cured is medium to heavy in body, light to dark brown in color, and strong in flavor. It is so-called because of the smoky flavor and aroma it receives from "firing" it over open fires in the curing barns. It is used for making snuff, roll and plug chewing tobacco, strong cigars, and heavy smoking tobacco. Production currently amounts to around 50 million pounds annually, of which about half is exported.

Figure 2.--Kentucky-Tennessee fire-cured plant. Fire-cured is also grown in Virginia.

Class 3 - Air-cured is so-called because it is cured under natural weather conditions, usually without the use of supplementary heat.

(a) Light air-cured is normally very thin to medium in body, light yellow shaded toward red to reddish brown in color, mild in flavor, and is used chiefly in making cigarettes. It is usually combined with flue-cured and small quantities of imported or "Turkish" tobacco to form the blends for cigarette manufacture. Each of the two types, burley and Maryland, has special characteristics.

(See following page for descriptions of burley and Maryland.)

(b) Dark air-cured is medium to heavy-bodied and ranges from light to medium brown in color. It is used in the manufacture of about the same products as the fire-cured types--mainly for chewing tobacco and snuff, but also to some extent for smoking tobacco and cigars. Annual production is decreasing, and now amounts to less than 25 million pounds. Exports are about 4 million pounds a year.

Figure 3.--Burley plant. Burley is grown principally in Kentucky and Tennessee.

Burley, on an area basis, is the most widely grown single type in the United States. It is produced in eight States, and over 520 million pounds are produced annually--more than one-fourth of all the tobacco grown in this country.

Burley is desired for its flavor and aroma for cigarette blends, and cigarettes currently account for nearly 90 percent of the domestic consumption of burley. In addition to its use in cigarettes, it also goes into the manufacture of pipe tobaccos and plug and twist chewing. Exports have ranged between 46 and 63 million pounds annually in recent years.

Maryland is usually thought to be about ideal as to its burning qualities in the manufactured form. This is one of the important reasons for its use in cigarette blends. Production has averaged about 38 million pounds annually in recent years. Exports have been declining and now total 10 to 12 million pounds a year.

Figure 4.--A typical plant of Maryland tobacco, topped and suckered just prior to harvesting.

Classes 4-6, cigar leaf types are all air-cured, and are classified according to the principal usage of the tobacco--that is, as filler, binder, or wrapper--but all are used to some extent for other purposes. For instance, tobacco from binder and wrapper types may be used for all three purposes, and some of the lower grades from all three types may go into scrap chewing. Annual cigar-leaf production is now about 120 million pounds, including Puerto Rican. Exports are around 6 to 8 million.

Tobacco of the cigar-filler class is of medium to heavy body. It is so called because of its main use as the core or body of the cigar. For this purpose, the principal factors to be considered are flavor, aroma, and burning quality.

The cigar binder-types, as indicated by the name, were until recently used mainly for binding the bunched filler into the form and shape of the cigar. Natural leaf binders must have good burning quality, aroma, and elasticity. However, in the last few years, reconstituted tobacco sheet has rapidly been replacing the natural leaf for cigar-binder purposes. As a result of this change, scrap chewing tobacco is the principal outlet for the binder types.

Cigar wrappers are the most difficult and the costliest tobaccos to grow. They are used primarily for the outside cover on cigars, and leaves must be elastic, free of injury, uniform in color, and have good burning qualities. They should also be very thin, smooth, and of fine quality. In order to produce leaves with such properties, it is necessary to protect them against the sun and the extremes of weather. So the fields are enclosed with a framework covered with cloth (fig. 5). This cloth screening guards against the direct rays of the sun and the force of strong winds, and also provides some protection from insects and from overnight changes in temperature. These types are commonly called "shade-grown" as descriptive of this method of cultivation.

Figure 5.--Aerial view of Connecticut Shade tobacco tents.

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Perique. In addition to the major classes, some "miscellaneous" types are grown, the most important of which is Perique (type 72). It is grown on a narrow strip of land in St. James Parish in Louisiana, and comprises only a very small part of total United States production. It is a unique kind of tobacco, noted for its pleasing aroma, and small quantities are used in blends in the manufacture of fancy smoking tobacco. Annual production is around 250 thousand pounds, and a large percentage is exported.

The following table shows the approximate normal volume of production, percentages used domestically and exported, and the usage in manufactured products, by kinds:

Volume of production, domestic disappearance and exports, and domestic usages in manufactured products, by kinds

Class	Typical production: Quantity	Typical production: Percentage of total	Disappearance: Domestic	Disappearance: Exports	Usage in products: Principal	Usage in products: Other
	Million pounds	Percent	Percent	Percent		
Flue-cured	1,225	59.2	62	38	Cigarettes	Smoking, chewing
Fire-cured	50	2.4	54	46	Snuff	Chewing, strong cigars
Air-cured:						
Burley	600	28.9	90	10	Cigarettes	Smoking, chewing
Maryland	35	1.7	64	36	Cigarettes	Cigar filler
Dark	22	1.1	74	26	Chewing	Smoking, snuff, cigar filler
Cigar filler	90	4.3	99	1	Cigar filler	Scrap chewing
Cigar binder	30	1.5	90	10	Scrap chewing	Cigar binder
Cigar wrapper	18	.9	70	30	Cigar wrapper	
Total	2,070	100.0	73	27		

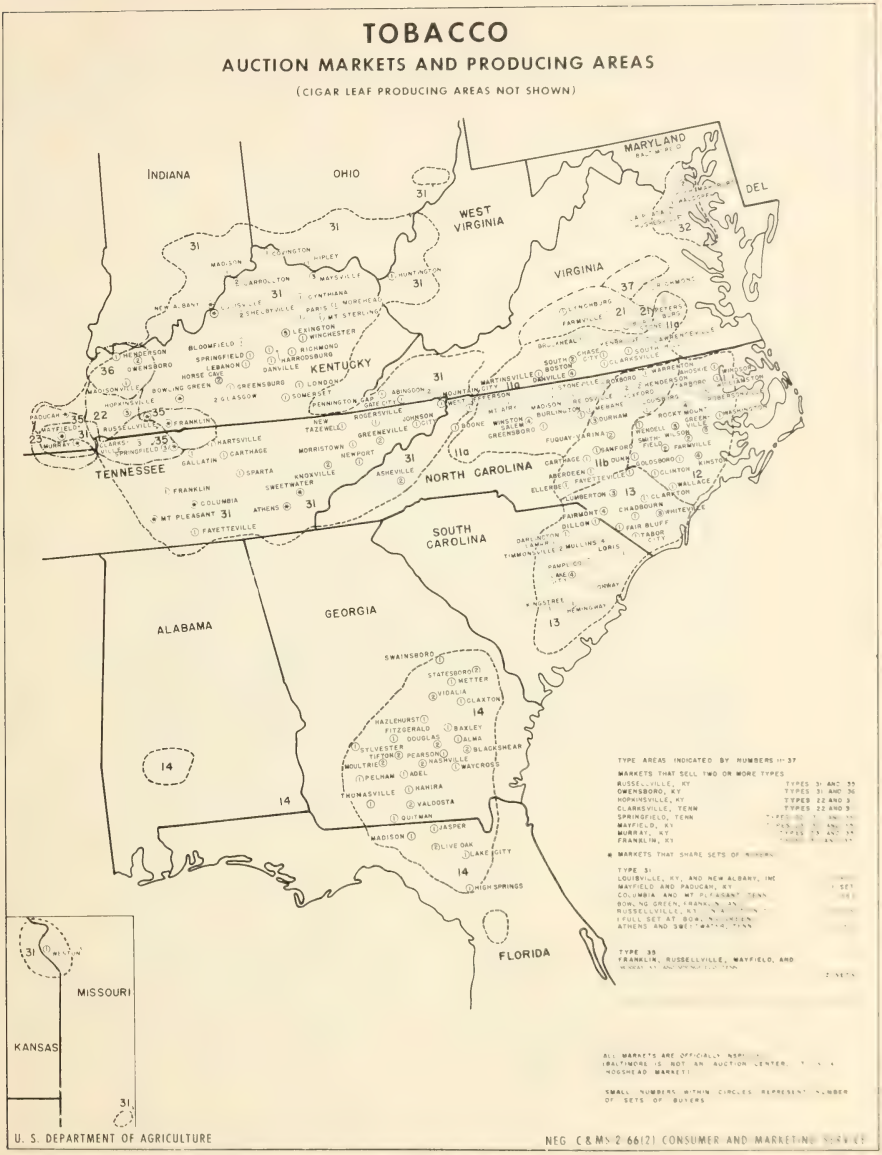
TOBACCO
AUCTION MARKETS AND PRODUCING AREAS
(CIGAR LEAF PRODUCING AREAS NOT SHOWN)
INDIANA
OHIO
WEST VIRGINIA
MARYLAND
DEL
VIRGINIA
KENTUCKY
TENNESSEE
NORTH CAROLINA
SOUTH CAROLINA
GEORGIA
ALABAMA
FLORIDA
MISSOURI
KANSAS
TYPE AREAS INDICATED BY NUMBERS 11-37
MARKETS THAT SELL TWO OR MORE TYPES
RUSSELLVILLE, KY TYPES 31 AND 33
GWENSBORO, KY TYPES 31 AND 36
HOPKINSVILLE, KY TYPES 22 AND 3
CLARKSVILLE, TENN TYPES 22 AND 3
SPRINGFIELD, TENN TYPES 22 AND 3
MAYFIELD, KY TYPES 22 AND 33
MURRAY, KY TYPES 22 AND 33
FRANKLIN, KY TYPES 22 AND 33
MARKETS THAT SHARE SETS OF BUYERS
TYPE 31
LOUISVILLE, KY, AND NEW ALBANY, IND
MAYFIELD AND PADUCAH, KY
COLUMBIA AND MT PLEASANT, TENN
BOWLING GREEN, FRANKLIN, AND RUSSELLVILLE, KY
(FULL SET AT BOWLING GREEN)
ATHENS AND SWEETWATER, TENN
TYPE 33
FRANKLIN, RUSSELLVILLE, MAYFIELD, AND
ALL MARKETS ARE OFFICIALLY OPEN
(BALTIMORE IS NOT AN AUCTION CENTER.
HOGSHEAD MARKET)
SMALL NUMBERS WITHIN CIRCLES REPRESENT NUMBER OF SETS OF BUYERS
U. S. DEPARTMENT OF AGRICULTURE
NEG. C&MS-2 66(2) CONSUMER AND MARKETING SERVICE

figure 6

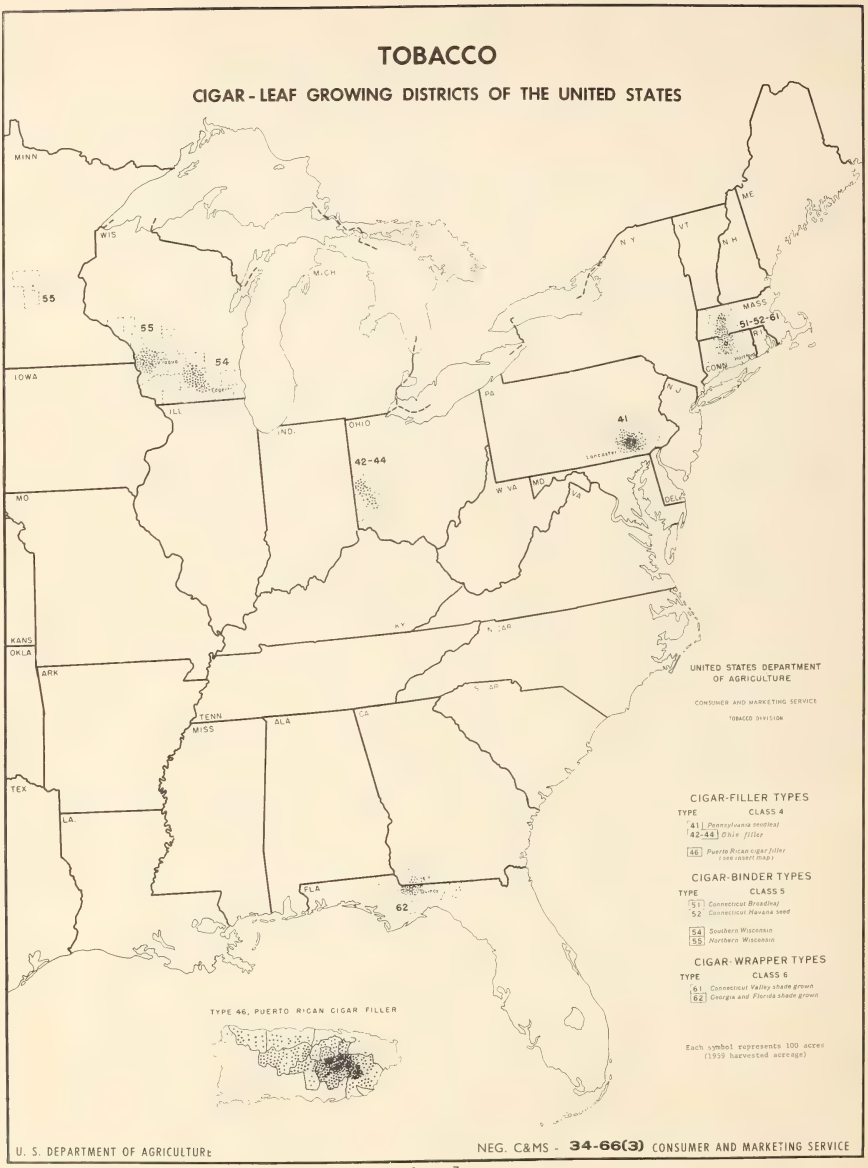
TOBACCO
CIGAR-LEAF GROWING DISTRICTS OF THE UNITED STATES
MINN
WIS
MICH
IOWA
ILL
IND.
OHIO
PA
N Y
VT
N H
ME
MASS
R I
CONN
N J
DEL
MD
VA
W VA
KY
N CAR
S CAR
TENN
MISS
ALA
GA
FLA
MO
KANS
OKLA
ARK
TEX
LA.
55
55
54
42-44
41
51-52-61
62
TYPE 46, PUERTO RICAN CIGAR FILLER
UNITED STATES DEPARTMENT OF AGRICULTURE
CONSUMER AND MARKETING SERVICE
TOBACCO DIVISION
CIGAR-FILLER TYPES
TYPE CLASS 4
41 Pennsylvania seedleaf
42-44 Ohio filler
46 Puerto Rican cigar filler (see insert map)
CIGAR-BINDER TYPES
TYPE CLASS 5
51 Connecticut Broadleaf
52 Connecticut Havana seed
54 Southern Wisconsin
55 Northern Wisconsin
CIGAR-WRAPPER TYPES
TYPE CLASS 6
61 Connecticut Valley shade grown
62 Georgia and Florida shade grown
Each symbol represents 100 acres (1959 harvested acreage)
U. S. DEPARTMENT OF AGRICULTURE
NEG. C&MS - 34-66(3) CONSUMER AND MARKETING SERVICE

figure 7

CULTURE

The various types of tobacco are grown in certain well-defined localities where the soil and climate have been found to yield a product of the properties desired for manufacture or for export. In addition to the factors of soil and climate, the methods of growing and handling are also determined by the kind of leaf that is required by the trade.

Seeding. Tobacco seedlings are grown in hotbeds or coldframes, called seedbeds, which are covered with glass in colder regions, and with cloth in warmer areas (fig. 8). The seeds are so tiny that one ounce contains about 300 to 350 thousand seeds. A pint of cleaned seed weighs only about 10 ounces; a bushel weighs about 39 pounds. A tablespoonful is enough to sow 100 square yards of seedbed, and will furnish enough plants to set 3 to 4 acres in the field. Actually, many growers sow about 100 square yards for each acre in the field, and while this practice produces considerably more plants than are required, it assures them an ample supply of seedlings at transplanting time.

Figure 8.--Flue-cured seed bed.

In sowing the seed, it is mixed with a large volume of fertilizer, corn or cottonseed meal, or other substance, such as sifted ashes (about 1 bushel for each ounce of seed), in order to obtain an even distribution. Germination begins when the temperature gets around 65°, and the plants are ready for transplanting to the fields when they have developed 4 to 6 leaves and are 6 to 8 inches high.

Soils and fertilization. The choice of soil and its fertilization varies greatly with the kind of leaf that is to be grown. Much of the tobacco produced in the United States, including flue-cured, Maryland, and the cigar binder and wrapper types, is grown on sandy to clay-loam with a sandy or sandy clay subsoil. Cigar filler, burley, and fire-cured are grown on silt loam and clay loam soils, with clay subsoils.

Fertilization is the basic factor in producing the specific kind of leaf desired. The farmer must know the proper kinds and amounts of fertilizers for his particular kind of soil. For instance, the quantity of nitrogen, which stimulates rapid growth, is of critical importance for flue-cured, but is not so important for burley and Maryland. A liberal supply of potash, in the form of sulfate, carbonate, or nitrate, reduces the susceptibility to bacterial leaf spot diseases, and also improves the "burning quality" of the tobacco. The use of chlorides in any form impairs the burning quality. Barnyard manures, when available, are used to considerable extent in some types, such as burley and Wisconsin, but very sparingly in the flue-cured and some other areas. The development of the plant is materially affected if any one of the chemical elements necessary for its growth is lacking in the soil.

Transplanting. Dates for transplanting range from about March 20 to the first week in May in Georgia and Florida, South Carolina, and eastern North Carolina, and from May 1 through June in the other growing areas. Just before the plants are to be set, the final preparation of the field is made by repeated disking and rolling or harrowing, and smoothing and furrowing the surface soil. Sometimes the field is left level, and sometimes it is ridged and the plants set on the ridges. Ridging is the prevailing practice in flue-cured and, to some extent, in the dark types, and level culture is chiefly used in the cigar types, burley, and Maryland.

Three methods are in general use in transplanting the tobacco seedlings into the field: (1) by use of a horse- or power-driven machine; (2) by use of a hand transplanter, and (3) by handsetting.

(1) The power-drawn transplanting machine is probably the most widely-used method for planting today, especially on the larger farms (fig. 9). It is operated by a driver, and carries two "setters," who ride in low back seats and alternate in placing the plants at the proper intervals in the row. The machine opens the furrow, dumps a measured quantity of water, and draws the soil about the roots of the plants as they are held in position by the setters.

(2) The hand transplanter is also commonly used, but mostly on the smaller farms. It is a device of lightweight metal, about 3½ feet in length, cone-shaped at the bottom, and with a handle at the top (fig. 10). It carries a water supply, and has an opening through which the plant is dropped. It makes a hole in the soil, and with one operation of the handle, drops the plant, and releases the proper quantity of water. The worker sets the plant by pressing the soil around it with his foot.

Figure 9.--Power-drawn transplanting machine.

Figure 10.--Planting tobacco with a hand planter.

(3) The handsetting method of transplanting is tedious and exacting and the one least used today. One worker drops the seedlings in the proper places in the rows, and one or sometimes two others follow to make the holes and set the plants.

The spacing of the plants in the fields differs widely according to the various types. The width between rows averages from 3 to 4 feet, with the plants ranging from 12 to 24 inches apart in the rows. This spacing allows for a range of 5,000 to 11,000 plants per acre.

The methods of cultivation of tobacco crops are similar to those practiced in connection with other crops, the main purpose being to keep the soil loose and the weeds down. It is important that the soil be well drained and aired. About four cultivations are made of most types, the last one being about 10 days before the normal topping time.

Topping. When the plant begins to mature, usually at or before flowering it is "topped," that is, the top or crown is broken off at about the third branch below the seed head, so as to cause the rest of the plant to develop more fully. The state of development of the plant at the time of topping affects the thickness and color of the leaves. For some types, several of the bottom leaves are also removed at topping time. The number of leaves remaining on the plant after topping usually varies from 16 to 22 in the flue-cured, Maryland, burley, and cigar types, and from 10 to 14 in the fire-cured and dark air-cured types. Following topping, the "suckers," or side shoots, are also removed at intervals to increase the leaf development.

HARVESTING AND CURING

HARVESTING

When the crop is mature, 90 to 120 days after transplanting, it is harvested by one of two methods: (1) by "priming," in which the leaves are picked individually from the plant from time to time as they ripen; or (2) by "stalk-cutting," in which the entire plant or stalk is cut.

Much of the success in curing tobacco depends on its being harvested when it is at just the right stage of ripeness--neither too ripe nor too green. This is probably the most critical point in the production of good quality tobacco, and it takes an experienced eye to recognize this proper stage of ripeness. Such experience is usually gained only through long years of growing and harvesting tobacco crops.

Yield per acre. Tobacco when harvested averages from 1,000 to over 2,000 pounds per acre, depending on the type, with the average for all United States tobacco about 1,900 pounds. The trend in recent years has been toward greater yields and, during the last decade, the yield for all types has increased from 1,700 to 1,900 pounds per acre--a gain of 11 percent.

(1) Priming. Flue-cured and cigar wrapper tobaccos are harvested by the priming method (figs. 11 and 12). Puerto Rican filler is also harvested almost entirely in this way. Beginning at the bottom, two to four leaves are picked from the stalk at a time. The fields must be gone over from 4 to 6 times, in order to get all the leaves at the right stage of ripeness.

Figure 11.—Loading primed flue-cured tobacco into a tobacco drag between the rows for hauling to the curing barn.

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Figure 12.--Priming Georgia-Florida Shade tobacco.

The leaves are prepared for hanging between the tier poles in the curing barns by different methods in the different types.

Flue-cured leaves are strung onto sticks 4 1/2 feet long, by attaching a string to one end of the stick, twisting it around the butts of bunches of three or four leaves each, for the length of the stick, and fastening it at the other end. About 30 or 35 bunches are strung to a stick and looped alternately on each side (fig. 13).

Figure 13.--Stringing flue-cured tobacco on sticks for hanging in the curing barn.

Figure 14.—Cutting the stalks of ripe burley tobacco.

Figure 15.—Loading speared burley tobacco onto trucks after wilting, for taking to the curing barn.

Cigar wrapper leaves are strung onto 4 1/2-foot sticks by attaching the string at one end and running a threaded needle through the base of the leaves arranged in pairs, back to back and front to front, for the length of the stick (about 15 to 22 pairs), and fastening it at the other end. In the Puerto Rican type, the string is sewed through the butt of each leaf (about 40 to 50 leaves to a string) and tied to the tier poles. No sticks are used.

(2) Stalk-cutting. Burley, Maryland, and fire- and dark air-cured, and most cigar leaf tobaccos are harvested by the stalk-cutting method (fig. 14). (In some areas, particularly burley, farmers may prime the matured lower leaves, so that the cutting of the stalks may be delayed until the plant is fully mature.) The entire stalk is cut close to the ground with a special type of hatchet, knife, or long-handled shears. Usually all plants in the field are harvested at the same time, but occasionally some less mature areas may be left and cut later. After the stalks are cut, they are generally speared onto sticks--4½ feet long (5 or 6 plants to the stick), and then left in the field a day or so and allowed to wilt, so they will not break in handling (fig. 15).

The density of the tobacco on the sticks (or the string, in the case of Puerto Rican) is an important factor in the curing process, as satisfactory curing is made difficult by crowding. Care is taken that space is left between the plants (or leaves) for proper circulation of air. The tobacco is now ready for hanging between the tier poles in the curing barns.

Along with chemical changes that take place during the curing process, there is also a loss in weight from evaporation of a large quantity of the water contained in the leaf when it is harvested. Fresh leaf, as it goes into the curing barn, usually contains about 80 percent of water, which is reduced to 20 or 25 percent in curing. Therefore, about 5,000 pounds of green leaf will be required to yield 1,000 pounds of cured leaf, and two tons of water will be lost in the curing process.

CURING

Methods of curing tobacco differ greatly among the various kinds. There are three essentially different ways of curing:

(1) air-curing, in which the tobacco is primarily cured under natural weather conditions, but fuel may be used to some extent;

(2) flue-curing, in which the tobacco is cured at elevated temperatures, but must not be subjected to smoke or odors;

(3) fire-curing, in which the tobacco is mostly cured with wood fires and the smoke comes in contact with the leaf.

The following outline shows the harvesting and curing methods of each of the kinds of tobacco;

Kind	Type	Harvesting method		Curing method		
		Priming	Stalk-cutting	Flue	Fire	Air
Flue-cured	11-14	x		x		
Fire-cured	21-23		x		x	
Burley	31		x			x
Maryland	32		x			x
Dark air-cured	35-37		x			x
Cigar filler	41-44		x			x
Cigar filler	46	x				x
Cigar binder	51-55		x			x
Cigar wrapper	61-62	x				x
Perique	72		x			x

The three curing processes and the barns used for each are described separately below.

Air-curing (burley, Maryland, dark air-cured, and cigar types)

Type of barn. Barns used for air-curing tobacco are 30 to 40 feet wide and vary in length up to 300 feet. Boards on the outside of the barn may be either vertical or horizontal. About every third board is hung on hinges as a ventilator. Horizontal bottom ventilators are also provided along the entire length of the sides of the barn to admit air near the ground, and many barns have additional ventilators along the peak of the roof (figs. 16 and 18).

The barn usually has driveways extending through it, with doors at each end large enough to allow a wagon or truck to pass through easily. The interior consists of a framework carrying tier poles for supporting the laths on which the tobacco has been placed (fig. 17). The spaces between the poles are called tiers. Barns are built 3 to 4 tiers high. The first tier of poles is at least 9 feet from the ground, so that the tobacco on the bottom tier clears the ground by at least 3 feet. The other tiers are 4 or 5 feet apart. The tier poles are usually about 16 feet long, and stout enough to carry at least 800 pounds.

Air-curing operation. All of the tobaccos that are air-cured are harvested by stalk-cutting, except shade-grown wrapper and Puerto Rican filler, which are harvested by priming. The surplus food supply that the leaf accumulates while ripening helps it to live for several days after being harvested. When this is exhausted, the leaf dies and is then nearly cured. We might say, therefore, that air-curing tobacco is forcing the leaves to go through a process of gradual starvation under proper conditions.

The time required for completing the air-curing of stalk-cut tobacco varies, depending on weather conditions, from 5 to 8 weeks for the cigar types, and from 4 to 6 weeks for Burley, Maryland, and the dark air-cured types.

When cured, the color of Burley is a tan to reddish brown, as compared with the deeper brown of cigar leaf. Although the stalks may still be quite green, the cure is finished when the midrib (central vein of the leaf) is dried out and free of sap. The amount of supplementary heat required during the curing period varies considerably with the weather, and is particularly important under cold or excessively wet conditions.

Figure 16.--Exterior view of burley curing barn.

Figure 17.--Interior of burley curing barn showing green tobacco, which has been speared on sticks, being placed on the tier poles.

Figure 18.--Maryland curing barn.

The air-curing of primed shade-grown cigar wrapper and Puerto Rican filler usually takes from 4 to 6 weeks. Supplementary heat is almost always used in curing the shade tobacco, essentially to protect the product, and to maintain the temperature at a favorable level rather than to elevate it.

When fully cured, the leaf is too dry and brittle to be handled without serious damage. However, tobacco leaves absorb moisture from moist air and they will readily absorb 20 percent or more under warm, humid conditions. Therefore, the tobacco is not taken down from the tiers until after damp weather has made the leaves soft or pliable enough to be handled without breaking. Such weather is often spoken of as a "tobacco season," and the leaf in this condition is said to be "in case" or "in order."

In the case of stalk-cut tobacco, as the plants are taken from the sticks they are usually piled in heaps in such a way that the tobacco will not dry out for several days. The leaves are stripped from the stalks as soon as possible.

In the auction market areas, as the leaves are removed from the stalks, they are sorted into several grades, according to stalk position, quality, color, and size. Leaves of different grades are tied with another leaf at the butts to form "hands," of about 10 to 40 leaves each, depending on the type. The tobacco is then bulked down until time for delivery to the auction market.

Figure 19.--Curing barn for stalk-cut cigar binder tobacco in the Connecticut Valley.

Figure 20.--The curing of this stalk-cut Connecticut Valley cigar binder is well along. Note open ventilators at top.

Stalk-cut cigar tobaccos are packed in farm bales or bundles as the leaves are stripped. Most cigar tobacco is now sold unsorted, except that very inferior qualities are thrown out as the leaves are stripped from the stalk. Specially constructed box presses are used for packing. After placing four heavy strings in the box, it is lined with heavy manila paper which is used to wrap the bundle. The leaves are laid with the tips overlapping, and the butts of the leaves to the outside of the bundles on each end. The leaves are not tied in "hands" by the growers, as in the auction market areas (except some of the Pennsylvania type). When the box is full, the tobacco leaves are pressed down, the paper folded over, and the strings tied. The tobacco is ready for delivery to a buyer. The weight of a farm bale usually ranges from 30 to 50 pounds.

After the primed shade-grown tobacco is completely cured, the sticks of leaves are taken down and placed in temporary bulks with the sticks to the outside. The tobacco is then removed from the sticks by detaching the string at each end and tying the ends together to form a hand. The hands are packed in wooden boxes for delivery to the packing house. After curing, the primed Puerto Rican tobacco is prepared for delivery by detaching the strings from the tier poles and tying them together around the rolled up leaves to form hands.

Flue-curing (flue-cured types)

Type of barn. Barns used in curing flue-cured tobacco are small and simply built (figs. 21 and 22). They are usually square, with inside measurements 16, 20, or 24 feet, and contain 4 to 6 sets of tier poles about 4 feet apart. The inside dimensions of the barn are usually some multiple of 4 feet, as this is the normal distance between the tier poles on which the sticks are hung. Flue-curing barns are insulated and means of ventilation is provided at the top and around the bottom.

Generally, flue-curing barns are heated by sheet iron flues, extending around the floor of the barn (fig. 23). The flue finally passes out through the wall and is fitted with a smokestack to discharge the fuel gasses and increase the draught. Formerly, these flues led from wood-fired furnaces of stone or brick built partly outside the barn at the ground level. Wood was practically always used as fuel in the furnaces, because it was usually available on the farm. More recently, however, fuel oil and gas have become widely used as fuel, because of the scarcity of wood and the saving in labor. Also, more uniform curing conditions are possible with these types of fuel.

Open oil and gas burners within the barns have also come into rather widespread use. With this type of burner no flues are required. When they are used, special care in their operation and maintenance is necessary, in order to insure proper burning of the fuel. Smoking or improperly operating burners may result in contamination of the tobacco and make it unsuitable for the usual manufacturing purposes.

234-023 O - 66 - 4

Figure 21.--Many of the modern type flue-cured curing barns are heated by oil or gas.

Figure 22.--The older type log curing barns had wood-burning fireboxes on the outside.

Figure 23.--Inside view of a curing barn showing metal flues that carry heat from a furnace. ⟶

Flue-curing operation. All flue-cured tobacco is harvested by priming. A curing barn is completely filled with the tobacco as it comes from the field, in one day, so that there will be uniformity in the curing. Heat is applied with attention to the gradual changes in the leaf, particularly to the changes in color and moisture content. Curing may be considered to take place in three stages: (1) Yellowing, (2) drying of the leaf, and (3) drying of the stem. (1) In the yellowing stage, the heat is maintained at around 90° to 100°, for 24 to 40 hours under average conditions; (2) it is then moved up fairly rapidly to 135° to 140° to dry the leaf and fix the color, which takes from 30 to 36 hours; (3) and then is gradually raised to 170° to 175° and maintained at this level until the stems are thoroughly dry. Careful watch is kept throughout the whole curing process, which is completed in 4 to 6 days.

When the tobacco is ready to be taken down, the barn is left open during the preceding night, and the floor may be sprinkled with water, so that enough moisture may be absorbed by the leaves to bring them into condition for handling. If the leaf can be folded in the hand without breaking the stem, it is in proper condition to be taken down without injury.

When the sticks of tobacco are taken down, they are removed to separate buildings called "packhouses," where they are bulked down in windrows. These are rearranged at the end of a week or ten days to improve the color of the leaf. Sometime prior to delivery to the auction market, the tobacco is removed from the sticks and sorted into different lots or grades (fig. 24). As a rule, the different primings are handled separately and only a few grades are made of each. Care is taken to remove all the strings by which the leaves were attached to the sticks.

Figure 24.--Sorting and tying flue-cured tobacco in preparation for marketing.

Except in the Georgia-Florida area, the leaves of each lot are tied into hands, of about 30 leaves each, and replaced on the sticks for hauling to market. If the tobacco is not to be immediately taken to market, it is again bulked. In the Georgia-Florida areas, the sorted lots of leaves are placed on sheets without tying in hands, and are delivered to market in this manner.

Fire-curing (fire-cured types)

Type of barn. The old type of barn used for fire-curing is built of logs and the cracks daubed with mud. These barns are small, but generally high enough for 5 sets of tier poles. Modern barns (fig. 25) are frame buildings, much larger, with passageways through which a loaded wagon or truck may be driven directly beneath the tier poles.

Fire-curing operation. Fire-cured tobacco is harvested by stalk-cutting. Usually no heat is required during the first stage of the curing, in which the leaf begins to yellow. After the tobacco has been in the barn from 3 to 5 days, slow fires of hardwood or hardwood sawdust are started on the floor (fig. 26) and temperatures kept low until it is completely yellowed. Temperatures are then increased and the higher heat maintained until the leaf tissue is pretty well dried out. Altogether, the fires are kept burning for 3 to 10 days in some sections, and 10 to 40 days in others.

The main objective in fire-curing is to give the leaf a special smoky taste and aroma, which is accomplished through contact with the smoke from the open fires. Care is taken to regulate the proper combination of heat, humidity, and ventilation in order to prevent injury to the leaf, and to protect it against mold and discoloration through scalding. Caution is also used in guarding against the danger of barn fires, as these can result in the loss of entire crops.

When the plants are thoroughly cured and have absorbed enough moisture to make them pliable, they are removed from the sticks and the leaves stripped and sorted. Three principal grades are usually made, mainly on the basis of body and the position of the leaf on the stalk, and these may be further subdivided on the basis of size and color. The tobacco is then tied into "hands" for marketing.

Curing Perique tobacco

The curing process for Perique is peculiar, and no other tobacco is cured in just the same way. The entire plant is cut, and by means of a nail driven at an angle through the butt of the stalk, each is hung separately from wires stretched across the curing barn. After 8 to 14 days, when the leaves have dried and turned brown, they are stripped from the stalks, formed into small twists, and packed in casks under great pressure until they turn black. Every few days during the first month, the tobacco is taken out, loosened, and put back again under the pressure. This process gives Perique its characteristic aroma. It is cured wholly in its own juice, without any other ingredients. It is allowed to ferment for about nine months, under this pressure, and is then ready for market.

Figure 25.--Fire-cured curing barn.

Figure 26.--Fire-cured tobacco after curing is completed. Note remnants of fires on the floor.

Around 95 percent of the tobacco grown in the United States is marketed by the "loose leaf" auction method. Most of the remaining 5 percent, made up principally of cigar-leaf tobacco, is sold directly on the farms. A small quantity is sold in hogsheads.

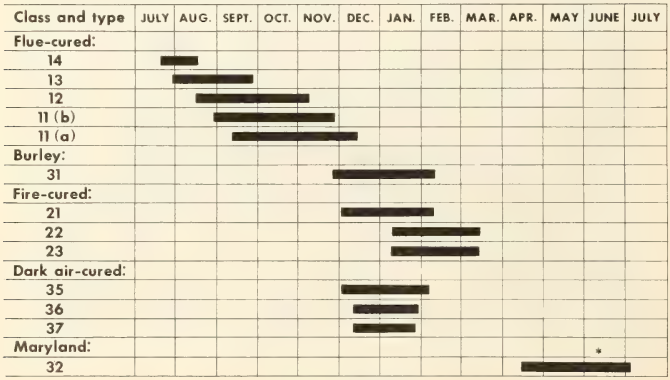
The loose leaf auction system as a method of selling first appeared at Richmond, Va., in 1842. Following the Civil War, the system came to be widely accepted throughout the rapidly-expanding flue-cured belt in the North Carolina and Virginia areas. Auction marketing was introduced in the Kentucky and Tennessee areas at Clarksville, Tenn., in 1901.

THE AUCTION METHOD OF SELLING

Growers deliver their tobacco to the auction warehouse of their choice, where it is sold to the highest bidder. The bidders are buyers for manufacturers, dealers, and exporters; and independent dealers or speculators. The auction system is of vast proportions as it must provide the facilities for handling nearly 2 billion pounds of tobacco annually, mostly within the period of August through February.

The length and period of the marketing season varies for the different types, and, to some extent, from year to year. The selling begins when the Georgia and Florida flue-cured markets open toward the end of July of the year of production, and ends when sales in Maryland are completed about the first week in July of the year following production. The season is so staggered that it is possible to find an auction sale in progress in some area almost any time during the year. The following chart shows the approximate marketing periods for the types sold at auction:

APPROXIMATE PERIODS OF TOBACCO AUCTION MARKETING SEASONS



U.S. DEPARTMENT OF AGRICULTURE NEG. C&MS 193-66(8) CONSUMER AND MARKETING SERVICE

Markets are situated in towns or cities in the growing areas where one or more warehouses sell tobacco at auction. There are 931 warehouses at the 175 auction markets in the United States (1965). The largest market has 32 warehouses, and some of the smaller markets have only one. They are located in 12 states and sell 13 types of tobacco, as shown in the following table:

Tobacco auction markets and warehouses, by States and classes, in the United States, 1965-66 season

State	Flue-cured (5 types)		Light air-cured 1/ (2 types)		Fire-cured (3 types)		Dark air-cured (3 types)		Total (13 types)	
	Markets	Warehouses	Markets	Warehouses	Markets	Warehouses	Markets	Warehouses	Markets	Warehouses
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Va.	10	48	3	18	3	7	1	1	17	74
N. C.	44	211	3	17					47	228
S. C.	11	48							11	48
Ga.	23	92							23	92
Fla.	5	17							5	17
Md.			4	13					4	13
Ky.			30	248	3	12	7	36	40	291
Tenn.			20	130	2	18	1	7	23	155
W. Va.			1	2					1	2
Ohio			1	4					1	4
Ind.			2	4					2	4
Mo.			1	3					1	3
Total	93	416	65	434	8	37	9	44	175	931

1/ Maryland type, Maryland only; Burley, all other States.

Warehouse construction. The auction warehouse is designed for the purpose of providing space and uniform marketing conditions for the display and sale of farmers' tobacco. An important factor in warehouse construction is the provision for lighting. U. S. Department of Agriculture regulations require that the tobacco be classed and graded under "proper light for correct determination of grade or other characteristics of tobacco." Natural daylight has always been regarded as the proper source of lighting, and the type of building that provides such natural lighting is so distinctive that an auction warehouse can be recognized almost as far as it can be seen. The low roof, studded with sky-lights, characterizes it at once. However, artificial lights have been developed, which are satisfactory for grading and classing, and it is possible that such lighting may replace natural lighting to some extent in the future, particularly when new warehouses are being built.

Most warehouses have extensive selling space enclosed under one roof. Some of the largest buildings have an area as large as seven acres and can display as many as 7,000 baskets of tobacco at one time. However, the average warehouse is not this large. The floor is made of heavy planking or concrete, with a driveway down one or both sides, and, in some of the larger buildings, also down the middle. These are 3 to 3½ feet below the floor level for the convenience of farmers in unloading the tobacco onto the floor, and buyers in loading it out after the sale.

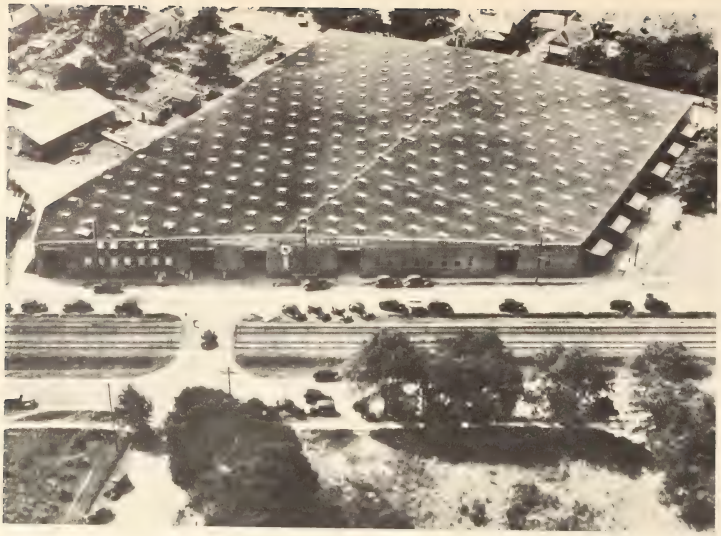


Figure 27.--Aerial view of typical flue-cured auction warehouse, showing skylights for obtaining uniform light on tobacco offered for sale.

Figure 28.--Interior of a burley auction warehouse.

Before the sale. Farmers deliver their tobacco in trucks to the warehouses, where it is packed on flat "baskets" about 40 inches square, furnished by the warehouse. On some markets, warehouse employees are required to supervise the packing of the tobacco onto the baskets. The baskets are weighed, and a ticket with several carbons is placed on each. This ticket shows the grower's name, the basket serial number, and the weight in pounds, and also has spaces for the buyer's name and grade mark, the selling price per pound, and the Government grade mark. The weight of the baskets may vary from just a few pounds up to several hundred. After the baskets are weighed, they are moved to the warehouse floor and arranged in long rows in preparation for the sale.

Figure 29.--Typical basket of type 12 flue-cured tobacco packed for display on sales floor.

Government inspection and market news services on auction markets. Shortly before the sale starts, a Federal inspector examines each lot (basket) of tobacco and grades it according to the official United States standards. He enters the grade, date, and his initials on the basket ticket, which then becomes the certificate of grade for that lot of tobacco. After the sale, data on grades and prices are collected from these tickets and consolidated. Averages are calculated and form the basis for the published market news and price reports. Current price reports are made available to the growers on the auction floors.

Inspection and market news services are in effect on all auction markets, and are authorized by The Tobacco Inspection Act (passed in August 1935). The Act provides for free and mandatory inspection on those markets that have been designated for the service by the Secretary of Agriculture, following favorable referenda of growers selling on such markets. Government grading and market news services aid the farmer in comparing the price offered for his grade with the current market price for similar tobacco, and in determining whether his price is a fair one.

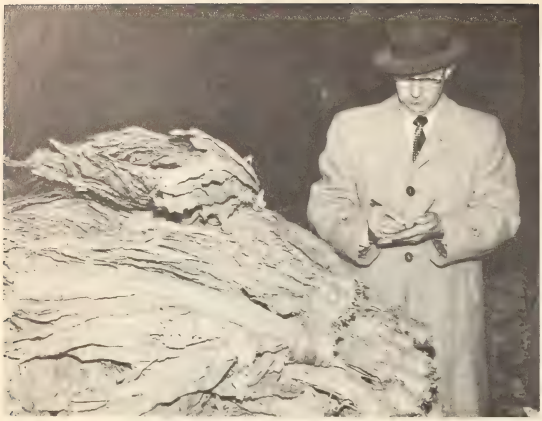


Figure 30.--Federal inspector grading burley tobacco in an auction warehouse.

No. 196
PLANTER Hardy
AND Jones
(Name of warehouse)

TOBACCO INSPECTION CERTIFICATE
This tobacco, inspected under the Tobacco Inspection Act by the U. S. Department of Agriculture, is certified to be:
Type 11B
Grade
By
(Date) (Inspector U.S.D.A.)
B. No. | Lbs. 154

No. 196
PLANTER Hardy
AND Jones
(Name of warehouse)

TOBACCO INSPECTION CERTIFICATE
This tobacco, inspected under the Tobacco Inspection Act by the U. S. Department of Agriculture, is certified to be:
Type 11B H 4 F
Grade
10-24-60 By H J
(Date) (Inspector U.S.D.A.)
B. No. | Lbs. 154

71 @ 1

Figure 31.--A basket ticket before and after the sale. Actual size (including stub) is 3-1/2 x 7 inches.

Tobacco Market Prices

GEORGIA AND FLORIDA FLUE-CURED - TYPE 14

DAILY
Tuesday
August 2, 1966

U. S. DEPARTMENT OF AGRICULTURE - CONSUMER AND MARKETING SERVICE - TOBACCO DIVISION
Georgia and Florida Departments of Agriculture, Cooperating

NO. 5
1966 crop-Untied

Gross Sales: Monday - 10,257,583 pounds - Average $69.76
Season - 35,292,052 pounds - Average $68.49

Auction bid averages and support prices by U. S. Grades - Tuesday, August 2, 1966:

U. S. GRADE	AVG.	SUP.
WRAPPERS		
A1F	$--	$85
A2F	--	83
A1R	--	82
A2R	--	81
LEAF		
B1L	--	79
B2L	75*	74
B3L	74	70
B4L	73	67
B5L	72	62
B6L	70*	58
B1F	--	79
B2F	--	74
B3F	74	70
B4F	73	67
B5F	73	62
B6F	69*	58
B1FR	--	78
B2FR	--	72
B3FR	--	68
B4FR	--	63
B5FR	--	58
B6FR	--	53
B1R	--	63
B2R	--	59
B3R	--	55
B4R	--	50
B5R	--	44
B3R	--	37
B4K	72*	61
B5K	66*	57
B6K	--	51
B3LV	73*	64
B4LV	72	59

U. S. GRADE	AVG.	SUP.
LEAF (Cont'd)		
B5LV	$70*	$55
B3FV	--	64
B4FV	71	59
B5FV	71	55
B3LS	--	55
B4LS	--	53
B5LS	--	49
B6LS	--	43
B3FS	--	55
B4FS	--	53
B5FS	--	49
B6FS	--	43
B3KL	--	52
B4KL	72*	50
B5KL	69*	46
B6KL	--	40
B3KF	--	52
B4KF	--	50
B5KF	--	46
B6KF	--	40
B4KV	--	50
B5KV	--	44
B6KV	--	37
B3KM	73*	55
B4KM	70	53
B5KM	70*	49
B6KM	--	43
B5RR	--	39
B4GL	--	50
B5GL	--	46
B6GL	--	40
B4GF	--	50
B5GF	--	46
B6GF	--	40
B4GR	--	45

U. S. GRADE	AVG.	SUP.
LEAF (Cont'd)		
B5GR	$--	$41
B6GR	--	33
B4GK	68*	45
B5GK	63*	42
B6GK	--	35
B5RG	--	35
B4GG	--	33
B5GG	--	30
SMOKING LEAF		
H1L	--	79
H2L	--	75
H3L	--	74
H4L	--	72
H5L	--	70
H6L	--	66
H1F	--	79
H2F	--	75
H3F	--	74
H4F	73*	72
H5F	--	70
H6F	--	66
H3FR	--	68
H4FR	--	65
H5FR	--	62
H6FR	--	58
H4K	71*	64
H5K	--	60
H6K	--	54
CUTTERS		
C1L	--	79
C2L	--	75
C3L	--	74
C4L	74*	73

U. S. GRADE	AVG.	SUP.
CUTTERS (Cont'd)		
C5L	$74	$72
C1F	--	79
C2F	--	75
C3F	--	74
C4F	--	73
C5F	73	72
C4LV	--	68
C4FV	--	68
C4LS	--	60
C5LS	--	58
C4FS	--	60
C5FS	--	58
C4KL	--	63
C4KF	73*	63
C4KM	72	63
LUGS		
X1L	--	74
X2L	--	73
X3L	73	72
X4L	72	69
X5L	71	63
X1F	--	74
X2F	--	73
X3F	73*	72
X4F	73	69
X5F	71	63
X3LV	73*	63
X4LV	72	60
X3FV	--	63
X4FV	71	60
X3LS	70*	58
X4LS	--	55
X3FS	--	58
X4FS	--	55

U. S. GRADE	AVG.	SUP.
LUGS (Cont'd)		
X4KL	$70*	$57
X5KL	--	48
X4KF	70*	57
X5KF	66*	48
X4KV	70*	50
X5KV	67*	39
X3KM	72*	61
X4KM	70	56
X4GK	--	45
X4G	66*	47
X5G	62*	40
PRIMINGS		
P2L	73*	67
P3L	71	65
P4L	70	59
P5L	66	50
P2F	--	67
P3F	71	65
P4F	70	59
P5F	65	47
P4G	66*	41
P5G	60*	33
NONDESCRIPT		
N1L	60	30
N1XL	64*	41
N1K	--	42
N1F	58*	35
N1R	--	28
N1GL	58	24
N1GF	--	30
N1GR	--	25
N1GG	--	22
N2	54	0

*Latest average established.

Stabilization Corporation does not accept "W", "U", "No-G" or "Scrap" tobacco.

KEY TO STANDARD GRADE MARKS FOR FLUE CURED TOBACCO

Groups
A-Wrappers
B-Leaf
H-Smoking Leaf
C-Cutters
X-Lugs
P-Primings
N-Nondescript
S-Scrap

Qualities
1-Choice
2-Fine
3-Good
4-Fair
5-Low
6-Poor

Color Symbols
L-Lemon
F-Orange
FR-Orange Red
R-Red
K-Variegated
D-Walnut
G-Green
LV-Lemon Greenish
FV-Orange Greenish
GL-Green Lemon
GF-Green Orange
GR-Green Red
GK-Green Variegated
GG-Gray Green
KL-Variegated Lemon
KF-Variegated Orange
KV-Variegated Greenish
KM-Variegated Mixed

Combination Symbols
LS-Lemon Stick
FS-Orange Stick
RR-Rank Red
RG-Rank Green
XL-Lug Side

For example: B4F designates leaf, fair quality, and orange color

Figure 32.--Sample tobacco market price report.

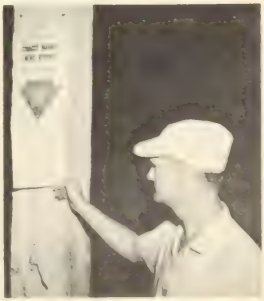


Figure 33.--The tobacco market price reports are placed at convenient locations in the auction warehouses.

The auction sale. The auction sales group is made up of (1) the auctioneer, (2) the warehouseman or his representative, who calls an opening price, (3) a corps of buyer representatives (usually 6 to 8), known as a "set of buyers," and (4) the warehouse clerk who follows and records the details of the sale (buyer's name and grade mark and the price bid) onto the basket ticket. Usually, a number of growers and other spectators are observing the sale.

The starting price is made by the warehouseman or his representative, and since it indicates the warehouseman's valuation of the tobacco, it has an important effect on the bids and eventually on the price paid. The auctioneer calls out the starter's opening price, receives the bids, and announces the selling price and buyer when the bidding is finished. Various quick signs are made by the buyers and accepted as bids by the auctioneer, so the auction sale moves along very rapidly. In the flue-cured district, rate of sales is 400 baskets per hour, and in burley, 360 baskets.

Figure 34.--Flue-cured tobacco auction sale in progress.

After the sale. As soon as the sale is under way, truckers begin moving the auctioned tobacco to side doors and loading it on trucks to be taken to the redriers or the repack houses of the various companies.

A farmer has the right to reject the bid price offered for any basket of his tobacco. He does this by "turning" the ticket, that is, by folding it with a crease, tearing off a portion, or otherwise mutilating it. Such lots are usually "dressed up" and put back in line for later sale on the same warehouse floor. It is assumed that, at the second sale, it will be bid in at a higher price. However, the grower may take the tobacco to another warehouse or market.

The grower receives payment for his tobacco from the warehouseman on the same day it is sold. Pricing and calculating clerks figure the amount due on each basket, immediately after sale, according to the price bid and the weight of the basket. After selling charges have been deducted, a check is issued the farmer against the warehouse account. Buyers usually settle with the warehouseman within a few days after the sale. Selling charges vary by types of tobacco, ranging from about 2 3/4 to 4 1/2 percent of the value.

Loan program on auction markets. Government price support is offered for all types of tobacco sold at auction unless growers disapprove marketing quotas. Under the program a price support level is established for each grade of tobacco. If the buyer's bid price on any basket of tobacco is not more than the Government loan rate for the grade, the grower may accept the loan rate. In this case he is paid in the usual way by the warehouseman, who is in turn reimbursed by the applicable cooperative association (which handles the tobacco after receiving it under loan) with funds borrowed from the Commodity Credit Corporation. Tobacco which cooperative associations receive from farmers under the loan program is sold through regular trade channels. If any net profits are realized, they go to the growers, but any losses are assumed by the Commodity Credit Corporation.

Figure 35.--Federal tobacco inspector certifying grade of burley tobacco being sold from loan holdings.

COUNTRY SALES - FIRE-CURED

In addition to sales of fire-cured at auction, a small quantity in the Kentucky and Tennessee area (averaging around 6 percent of the crop in the last few years) is sold directly at the farms. In earlier years, this farm or "barn-door" buying of the leaf was practiced to a much greater extent than it is today. Buying is done mainly by large concerns looking for choice crops at advantageous prices.

THE HOGSHEAD MARKET

Previous to the development of the "loose-leaf" auction system of sales, growers packed their tobacco in hogsheads for delivery to commission agents for selling. This was much the same procedure as was followed in the very early days of the country. Originally, the grower received a negotiable receipt for each hogshead delivered, before inspection and final sale, but soon after the beginning of the last century, the practice of selling the hogsheads of tobacco by auction after sampling became established, and this constituted the first form of sale by the auction system.

Today, the only such "hogshead" market in operation is the "closed-bid" auction at Baltimore, Md., which sells a small quantity of the Maryland type of tobacco. After the tobacco is delivered to the marketing association there, which operates as the commission agent, State inspectors take samples from the hogsheads and make them available for examination by prospective buyers after affixing the State seal to the hogshead. The buyers submit "closed" or sealed bids on such tobacco as suits them; these bids are opened at a specified time and the highest bid is accepted subject to grower approval.

Since the establishment of the loose-leaf markets in Maryland in 1939, most of the tobacco grown in the State has been sold on the auction floors.

CIGAR-LEAF MARKETING (COUNTRY SALES)

In most of the cigar-leaf tobacco districts, farmers contract for the sale of their tobacco at the farm, a system known as "barn-door" marketing. This may be done during the growing or curing season, but in recent years, practically all is sold after it has been cured, stripped, and baled. Buyers may be cigar manufacturers or independent packers, or their representatives. Although competitive bidding exists in the sense that various buyers inspect the tobacco and make offers, competition is not as apparent as in the auction method of sales.

The buyers ride over the producing districts from time to time during the growing season, and note the progress of the individual crops, as well as the changes in the acreages and crop prospects as compared with other years. In this way they keep themselves informed on the location of desirable crops.

Sales may be at a flat price per pound for the entire crop; or, as is more common, at separate rates per pound for the two main groups made at stripping: (1) those suitable for cigar-manufacturing purposes, and (2) those (known as stemming grades) suitable primarily for the manufacture of scrap-chewing.

Cigar wrapper is grown under almost every kind of arrangement imaginable. Sometimes the buyer rents the land, hires the owner as foreman, and has him grow the tobacco for his (the buyer's) account; and in some cases the buyer and farmer each contributes certain specified items of cost and each shares in the proceeds in relation to his contribution. A common practice is the growing of the tobacco by the manufacturer himself on his own land. Sometimes a farmer, who thinks he has an unusually fine crop and believes the prevailing market will improve, has his tobacco sorted, sweated, packed, and stored for sale at a future time.

Loan program in the cigar-leaf areas. Price support loans are also available in the cigar leaf areas (except shade-grown) where marketing quotas have not been disapproved. The cooperative associations, acting as agents for the Commodity Credit Corporation, arrange for facilities, as necessary, for receiving, grading, packing, and storing tobacco. Any eligible grower may deliver his tobacco to the receiving point, where a Federal inspector places a grade on it. If he accepts the loan rate for the grade, he receives the proceeds of the loan from the association, payment being made with funds borrowed from the Commodity Credit Corporation. In case he decides not to accept the loan, he may withdraw his tobacco. As explained under the auction system above, tobacco which cooperative associations receive under the loan program is sold through regular channels. Any net profits realized go to the growers, but losses are assumed by the Commodity Credit Corporation.

STORAGE AND AGING

Tobacco in its freshly-cured state as marketed by growers is not suitable for manufacturing purposes. Aging is required to complete its development. This involves chemical change, and in many respects may be regarded as an extension of the curing process. The taste of freshly-cured leaf is unpalatable and the aroma is biting and pungent. Aging improves the aroma and tends to eliminate rawness, harshness, and, in part, the bitter taste which characterize the leaf when it is first cured.

Tobacco is normally marketed in "higher order" (containing more moisture) than is desirable for storage and some steps must be taken to correct this condition or the leaf will decay or deteriorate in storage. As soon as it goes into the hands of the dealer or manufacturer, it is rapidly prepared for storage.

Tobacco production in the United States is usually thought of as falling into two broad groupings from the standpoint of handling and preparation for storage; namely, auction market areas (types 11-37), and cigar leaf areas (types 41-62).

AUCTION MARKET AREAS

Practically all of the tobacco sold in the auction market is packed in what is known as hogsheads for storage and aging. These are round barrel-type containers usually about 4 feet in diameter and 4 to 5 feet in height. The use of hogsheads dates back to early colonial days when the grower packed his own tobacco and had to get it to a river port; these barrel-like containers could be rolled along the roadways leading to the ports. Some tobacco that is to be exported is packed in boxes or cases, but most is still put into hogsheads.

In preparing the tobacco for packing in the hogsheads, practically all sold in the auction areas is redried. The principal exceptions to the redrying method of preparation for storage are in the Kentucky-Tennessee fire-cured areas, where some of the tobacco is packed with very little or no drying, and in Maryland, where it is in a very dry condition when marketed.

The redrying process involves (1) the complete drying out of the tobacco and (2) the application of uniform moisture throughout all the leaf. Redrying is the most expeditious method of getting the tobacco into the proper order (condition with respect to its moisture content) for storage. Uniform moisture content helps to reduce breakage in packing, and aids in the "aging and fermentation" of the leaf. Most of the redrying facilities are concentrated in towns where the larger auction markets are located.

The tobacco is moved from the auction floor to the "receiving rooms" of the redrying plants, where the baskets are resorted according to grades or blends of grades and lined up--about 8 to 10 of the same grade or blend of grades--along conveyors or "hanging lines." The conveyor line is a moving chain that carries 4-foot sticks placed end to end, and as it moves along, workers place one or two hands from each basket over each stick. This method

Figure 36.--Unstemmed burley tobacco entering a redrying machine in a redrying plant.

Figure 37.--Flue-cured tobacco being placed into hogs-heads as it comes from the redrying machine.

of mixing the hands from several baskets results in a more uniform pack, and is a common practice among dealers and exporters, and, to some extent, manufacturers. The workers are trained to watch the color and quality, and if a bundle (hand) does not match the grade it is usually laid aside for re-classifying. This pulling-out of out-of-grade hands is known as "bundle-picking." (In areas where the tobacco is marketed untied, it is placed on a conveyor belt, and out-of-grade leaves picked off.) Tobacco that is to be stemmed before redrying is placed on a conveyor belt that carries it to the stemming machines, rather than on the sticks.

When the sticks full of bundles reach the end of the hanging line, they are placed on chain conveyors that carry them slowly through the redrying machine. (For untied tobacco and stemmed leaf ("strips"), belts known as "apron conveyors" are used.) The operation takes about 40 minutes. The tobacco moves first through a steam-heated chamber where practically all of the moisture is removed by means of air directed or blown through and over the leaf. It then passes through a cooling section in preparation for the ordering section, where a controlled and uniform amount of moisture is added. As the "redried" tobacco emerges from the other end of the machine, the sticks are removed from the conveyor, and the tobacco pulled off, placed in the hogsheads, and packed under pressure.

A large proportion of flue-cured, burley, and Maryland tobacco purchased for domestic usage, as well as some that is to be exported, is stemmed before being redried and packed for storage. This means that the tough stems and veins in the center are removed, leaving only the tender part of the leaves. This practice of stemming before storage has several advantages: (1) Stemming costs are less, and the leafy tissue is damaged less in the stemming operation, when the leaf is stemmed in the green stage, than is the case when it is stemmed after storage; (2) a more uniform redrying operation is possible when the hands have been broken and the stems removed; (3) storage costs are less, because less storage space is required; (4) the risk of spoilage in storage is reduced; and (5) handling costs are reduced, because the leaf moves directly from storage to the manufacturing plant without the intermediate step for stemming.

The bulk of the stemming is now done by the "tipping and threshing" method. However, in untied tobacco, the "tipping" part of the stemming operation is not generally practiced, because the leaves are "tangled," and not in orderly arrangement. The bundles of tobacco are placed on the conveyor belt with the tips all in one direction against an adjustable "tipping" board that regulates the length of the tip to be removed. They pass through rotary knives that cut off about the first 6 or 7 inches, or usually 1/3 of the leaf. The cut-off tips are separately discharged from the conveyor belt and moved by a belt system to another location to be combined later with the "strips" from the lower part of the leaf. The stem is left in this tip since it is very small in diameter.

The bundle is then broken and the stem removed from the remainder, or lower 2/3 of the leaf, as it passes through thresher separators that separate the leaf tissue from the stem. In the operation, the unstemmed leaf is fed onto a rotating toothed cylinder, and the teeth pass through stationary combs,

thus stripping or shredding the leaf tissue from the stem. This is blown or pulled out by air currents through a duct in the top of the separator, and the stems, being heavier, fall onto a conveyor belt at the bottom. These stems usually pass through 2 or 3 more smaller separators to remove any small bits of leaf that may still remain attached to the stem. These "strips" from the threshed part of the leaf are then combined with the tip ends which were removed at the beginning of the stemming operation.

Most tobacco was formerly stemmed by a method known as "tipping and stripping," but this process is rapidly diminishing in importance. In this method, after the leaf is "tipped" and the bundle broken, a device on the chain conveyor picks up the butt ends of the stem and pulls each leaf through a claw-like mechanism that strips off the leaf tissue. The stems are then usually put through thresher separators to remove any remaining small particles of leaf.

After the stemming process has been completed, the "strips" are redried in the same manner as unstemmed leaf, except that they move through the redrying machine on a conveyor belt.

Methods of preparation for storage other than redrying are practiced in the Kentucky and Tennessee fire-cured district, and in Maryland. Kentucky and Tennessee fire-cured tobacco purchased by snuff companies is packed directly into the hogsheads as it comes from the warehouse floors, without any further drying. Although the trend is toward redrying by other purchasers in this area, some is still handled by the old method of hanging and bulking for a short period before packing in the hogsheads. In the Virginia fire-cured district, some tobacco is still hung in racks for natural air drying for a period of several months before packing into hogsheads. In Maryland, tobacco is marketed in a very dry state by the growers, and it will keep, when packed in the hogsheads, without further drying. However, some companies do redry their purchases to insure the more uniform distribution of moisture that will result in better aging of the tobacco.

Storage. The packed hogsheads of tobacco are moved from the redrying and packing plants to the storage warehouses of the various companies. Most of these warehouses are one story high, with a steel or wood framework and metal siding and roofing. The sides are flared outward within 4 or 5 feet of the ground, and in the offset thus formed, heavy screen wire is placed for ventilation. The warehouse usually has a concrete driveway running lengthwise through the center for convenience in moving the hogsheads into place. They are stacked in tiers three or four high on their sides.

Within the storage warehouses, during the fermentation process, tobacco passes through a series of "sweats," and undergoes chemical changes similar to those that take place in any closely packed, moist vegetable matter. "Sweat" is a term used for the natural fermentation process of tobacco, during which chemical changes that take place give it a sweeter, mellower flavor. The temperature rises in the closely packed, moist tobacco, and certain volatile products are thrown off. The reduction of nicotine in fermentation has an important relationship to the smoking quality of the tobacco, that is, its freedom from pungent, biting, unpleasant taste and aroma. The tobacco appears to

Figure 38.--Trailer truck of hogsheads of burley tobacco ready to go into storage.

Figure 39.--Flue-cured tobacco in storage. Overhead center line of skylights are for inspection of redried hogshead tobacco.

take on additional moisture and becomes soft and pliable, but there is actually a loss of moisture when the sweating period is finished. Colors tend to darken and become more uniform. As a rule, around two to three years of storage are required for the necessary aging by natural fermentation. Tobacco that is to be exported is not usually held in storage in this country.

CIGAR-LEAF AREAS

In handling cigar leaf, some is placed in bulks and fermented before packing for storage, and in some, fermentation occurs during storage.

The cigar-wrapper types are fermented by the process of bulk-sweating. The tobacco is taken directly from the curing barns to the packing houses, where it is built into bulks of varying shapes and sizes, according to local custom. The bulks of shade tobacco are usually 5 or 6 feet wide, 12 to 16 feet long, and 8 feet high, and contain 4 to 6 thousand pounds of tobacco.

Tobacco bulks are built up with great care and kept under close watch. Recordings are made of the temperature in the center of the bulk, and the bulks are "turned" or rebuilt every few days until the fermentation has been completed. The tobacco is further sorted - leaf by leaf - sized, retied, packed into bales, and stored in a cool place.

Figure 40.--Farm bales of Connecticut binder. This particular tobacco is being delivered to the Conn-Mass cooperative.

The cigar filler and binder types (except Puerto Rican) normally receive only a very limited amount of handling prior to storage for aging. Most of the tobacco is stored in farm bales as delivered by growers. These bales are rectangular-shaped packages containing 40 to 50 pounds of tobacco wrapped in brown paper with the ends left open. The tobacco is arranged with the butts at the

outside ends and the tips overlapping in the middle. Quite frequently, the bales are run through a heated sweat room for a few weeks before being shifted to permanent storage.

Formerly, when natural binders were used in all cigar manufacture, it was important to sort the leaf carefully with respect to soundness, color, length, etc. However, since the use of reconstituted tobacco sheet as the binder has become general, this is unnecessary except for the very small quantities still purchased for use as natural binder.

In the case of the filler types, since the trend is toward short filler, or the use of small pieces, it is also unnecessary for the leaf in these types to be carefully sized or sorted. Most of the tobacco to be used in short filler in cigars is bulk-sweated.

Figure 41.--Puerto Rican tobacco being bulked.

MANUFACTURING INDUSTRY

Cigarettes currently account for about 82 to 83 percent of the tobacco consumed in the United States. The remainder is about equally divided between cigars and the manufactured tobacco products (smoking, chewing, and snuff). The trend towards cigarettes has been rapid. As late as the early 1920's, cigarettes accounted for only one-fourth of our tobacco consumption, while manufactured tobacco products made up 50 percent of the total. However, the manufactured products have now declined to less than 10 percent of the total as consumers have turned to lighter, milder forms of tobacco consumption. In terms of volume, per capita consumption has risen about 30 percent since the early 1920's.

In tobacco manufacture, the main purpose is to convert the cured leaf into a form convenient for use by the consumer, and for dispensing by the merchant. Manufacturing firms buy the cured "green" leaf from the farmer, store and age it, and manufacture it into products, which they distribute through wholesale and retail dealers to the ultimate consumer.

In the colonial period the export trade was the only commercial outlet for tobacco leaf, but after the Revolutionary War, small manufacturing plants began to appear, and in 1790, 29 million pounds were used in manufacture. The product was a roll or twist form, from which portions were cut for chewing or smoking, or grated for snuff. Early in the 1800's, the manufacture of cigars began to assume importance. Imported Cuban leaf was principally used in their production. However, as the domestic cigar leaf types were developed, first in Connecticut and Massachusetts, and later in the Wisconsin and Pennsylvania areas, these were combined with the Cuban imports in cigar manufacture. By 1860, 45 cigar factories were in operation.

By this time, also, the manufacture of plug chewing had become established, and leaf used in this product was a new type being grown in Virginia and North Carolina, which was the forerunner of the modern flue-cured types. During the last quarter of the century, the manufacture of fine-cut chewing and smoking (mostly granulated) came into prominence in which leaf of another new type, White Burley, was used.

An outstanding feature in tobacco manufacture in the last quarter of the 19th century was the development of the cigarette machine, which first came into use in the early 1870's. Flue-cured was the principal leaf used at first and toward the end of the century, imported Turkish assumed importance in the development of the blended cigarette. Fifteen years after cigarettes were first made by machines, annual production passed the billion mark and by 1895, 4 billion were manufactured. Current production is around 557 billion (1965).

Today, about 2.2 billion pounds of domestic and 260 million pounds of imported leaf are used in tobacco manufacture in this country.

Taxes. Tobacco in most all countries in the world has always been a popular item for taxation. In the United States a Federal tax on manufactured tobacco products has been in effect for nearly a century, and revenue derived

from this source now amounts to over 2 billion dollars annually. The Internal Revenue Service of the United States Treasury Department, which administers the tax legislation, classifies products in the manufacturing industry for taxation purposes as follows: (1) Cigars, (2) cigarettes, and (3) manufactured tobacco, which includes chewing (plug, twist, fine-cut, and scrap), smoking, and snuff.

In addition to the Federal tax, 49 of the 50 States impose taxes on one or more products, and revenue from such taxes now totals about two billion dollars yearly. Further taxes are levied on tobacco products by some city governments.

History records that tobacco was used by the American Indians in each of the three ways in which it is used today, and changes in usage through the years relate to the comparative popularity of these three forms. While consumer habits are not subject to sudden change, in the long-time sense there have been marked shifts in forms of use. The general direction has been from "strong" tobacco to "mild," from cigars to cigarettes, from chewing to pipe smoking, and from dark heavy-bodied types to lighter types. Changes in patterns of consumption usually entail shifts in the types of tobacco used in manufacture, and consequently shifts in the production of those types.

Blending. One of the most complex and important features of the manufacture of tobacco products is the blending of the leaves of different classes, types, grades, and qualities. All quality elements cannot be equally developed in the same leaf; for instance, some may be highly aromatic but have poor burning qualities, and some may be too heavy-bodied or strong unless mixed with lighter and milder leaf. Therefore, combinations are obtained which tone down elements which are overdeveloped, or strengthen those which are underdeveloped. In other words, types or grades of tobacco leaf used are selected for quality factors that complement each other in the blend.

Not only do blends combine different types of tobacco, but of a given type, they usually contain leaf from two or more years' crops, because the characteristics of tobacco crops vary from year to year. The effect of these differences is lessened, and the stability of the blend is maintained, by combining tobacco from different crops.

THE CIGARETTE INDUSTRY

The cigarette industry is by far the most important part of tobacco manufacturing, both in use of the leaf and in volume of sales. Its extraordinary development during the present century presents one of the most phenomenal aspects of tobacco history. This has been due to two principal factors--the perfection of the modern highly efficient cigarette machine and the development of the blended type of cigarette. The manufacturing of cigarettes is so highly automated that the cost of producing a pack of cigarettes (excluding tobacco material) is estimated at about 1 cent per pack.

The industry has always been dominated by a few concerns. Today about 99 percent of the cigarettes manufactured in the United States are produced by

six companies. The manufacture of cigarettes had its beginning in this country 1/ in 1872, when the first cigarette machine was invented, and by 1890, annual production had reached 2 1/2 billion. In these earlier years, cigarettes were made almost entirely of one kind of tobacco -- flue-cured, burley, or Oriental, but around the beginning of the twentieth century (1913), the blended cigarette appeared on the market, and this product, in which several kinds of American-grown tobaccos were combined with small amounts of Oriental, became immediately popular with consumers. Flue - cured and burley are the principal kinds used in making cigarettes. Also, most of the Maryland used in this country goes into blends, along with imported "Turkish" or Oriental kinds.

The following figures show the percentages and amounts of these kinds of leaf used in American cigarettes, as a whole (fiscal year 1964):

Type	Percentages contained in blends Percent	Leaf used Million pounds
Flue-cured	52.7	733
Burley	35.6	495
Maryland	1.2	16
Oriental	10.5	146
Total	100.0	1,390

In the factory, after aging, the first step in the chain of manufacture is the blending process (if the leaf has not been stemmed this is done first). Different grades of flue-cured, burley, and Maryland are combined, and a certain amount of Turkish or Oriental is added to improve the taste and aroma; and in order to keep the product consistent in taste, leaf from several crops of both the domestic and imported types are used in the blends. Each manufacturing company has its own special blend, which is a carefully-guarded secret, so that it is not generally known what proportions of certain tobaccos go into a particular brand of cigarettes. When the leaf is blended and ready to go into the cigarettes, it has a moisture content of 11 1/2 to 12 percent.

Cigarette manufacturers have developed a kind of reconstituted form of tobacco which uses fine particles and scrap and part of the stems to make a sheet which can be shredded with natural leaf for cigarettes. Most of the tobacco, however, is in the natural leaf form.

The blended tobacco is pressed into a solid cake and is then ready for slicing by large whirling rotary knives. It is then cut into slender shreds of the right consistency to be rolled firmly and smoothly into cigarettes. Some companies blend by slicing from the contents of hogsheads of each type and grade onto a moving conveyor belt.

Although the leaf used in manufacture is fully flavored itself, other flavors are sometimes sprayed over the shredded tobacco, principally as sweeteners or "casing compounds," and as an aid in preventing the smoke from being

1/ Cigarettes in their first primitive form are said to have been introduced by the Turks around 1855; but at that time, although they were paper-wrapped, they were known as "cigars."

offensive to nonsmokers. Flavoring substances or extracts may come from honey, maple, or other sugars, rum, fruit juices, such as apple or fig, vanilla and tonka beans, grape and berry wines, licorice, deer's tongue, cocoa, menthol, and others. Also, a moistening agent is added to insure proper moisture content after the product has moved into trade channels and after the pack has been opened. Treatment by certain chemicals, such as glycerin, serves to increase the moisture-holding properties.

Modern cigarette-making machines produce a continuous cigarette. They roll the cigarette, seal the paper around it, and stamp it with the brand name and then cut it into the proper length (regular or king-size). (fig. 42.) A "catcher" examines the cigarettes as they pour into a tray, and removes any that are imperfect. A check is made also on the weight to insure proper packing of the tobacco, as well as uniform quality and moisture content.

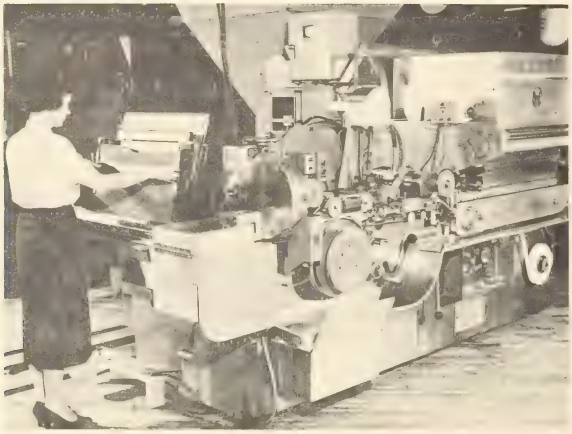


Figure 42.--Modern cigarette-making machine.

The "filter-type" cigarette now makes up a sizable proportion of total manufacture (estimated 65 percent in 1965). The filters are constructed of various substances, such as cellulose acetate, and other ingredients known by various trade names, and even of tobacco itself. These are attached in one continuous operation by means of a special device on the cigarette machine.

When the catcher's tray is filled, it is then moved to a packaging machine. Cigarettes are fed into one end of this machine, and tin foil, paper, and cellophane into the other end. In an instant a complete package of cigarettes is turned out. Standard packages contain 20 cigarettes each, arranged in three rows--two outside rows of 7 each and a center row of 6. An electric detector on the packaging machine rejects any pack that contains any defective cigarettes. Ten packs of cigarettes are placed into cartons mostly by special

machines for this purpose, and the cartons packed into cardboard shipping cases to be shipped to wholesalers for sale in this country, or overseas for the export trade. The normal shipping container holds 60 cartons (200 cigarettes to a carton), or 12,000 cigarettes.

Regular size cigarettes are 70 millimeters (mm.) and king-size, 85 mm. in length (1 inch equals 25.4 mm.). Most of the filter-tip brands are king-size, or 85 mm. long. Generally speaking, the filter plug is 15 mm. in length; the remaining 70 mm. making up the cigarette proper. Cigarettes are about 25 mm. in circumference.

Cigarette paper used in manufacturing cigarettes was formerly almost entirely imported. At the present time, however, most of the paper is manufactured in this country from flax grown and harvested in the United States. It is made from flax straw fiber, which is repeatedly bleached and refined during the manufacturing process. It must be very thin, and at the same time durable enough to prevent tearing or breaking in the manufacturing process; it must burn slowly and evenly at the same rate as the tobacco; it must contain tiny air passages, or pores, to control the amount of dilution of the smoke by air (and consequent flavor and nicotine content per puff); and it must be completely tasteless. The paper is first rolled in wide sheets on large bobbins, each of which contains enough to make 85,000 regular or 70,000 king-size cigarettes, and later it is slit into widths proper for the circumference of the cigarette.

Cigarette factories are constantly carrying on laboratory programs with a view toward maintaining and/or improving the quality of the product.

The cigarette industry currently employs about 37.7 thousand production workers. Additional thousands are employed in management, accounting, sales, etc. Around 557 billion cigarettes were manufactured in 1965, mostly for domestic consumption. However, about 23 billion were exported to over 100 foreign countries throughout the world and another 21 billion went to the Armed Forces overseas, to ship stores, as shipments to Puerto Rico, etc. Consumers spent about 7.6 billion dollars for the 511 billion cigarettes consumed in the United States in 1965. Per capita consumption (18 years and over) is now up to 213 packs annually. This represents an increase of nearly 116 percent since 1940. The Government now receives about 2.0 billion dollars annually from the Federal eight-cents-per-pack tax rate, and over one billion dollars is collected yearly among 48 States, the District of Columbia, and local governments, with tax rates averaging between 2 cents and 11 cents per pack.

THE CIGAR INDUSTRY

The cigar industry in this country began in homes on tobacco-growing farms. 2/ Shops employing skilled cigarmakers began to appear after 1800, and larger factories gradually evolved from these. The making of cigars on farms eventually disappeared, but the practice of making them by hand in the small shops persisted as an important phase of the industry throughout most of the 19th century.

2/ The first cigars known here were imported from the Spanish West Indies and were called "segars."

With the perfection of cigar-making machinery within the present century, the evolution of the industry into fewer and larger establishments has been rapid. In the last 25 years alone, the number of factories producing cigars has dwindled from 4,000 to about 330, and production has increased from 5 to over 8 billion. All cigars, except those of the very finest grades, are now made by machines.

There are three components of the cigar--filler, binder, and wrapper. For the manufacture of some cigars, imported leaf is used for part or all of the cigar. However, over two-thirds of the cigar leaf used in the industry is domestically grown. Cigar leaf is first stemmed; that is, the large or tough stems are removed, before it goes into the manufacturing process.

Reconstituted tobacco sheet. A comparatively recent development in the industry is the introduction of the use of a new tobacco form, "reconstituted sheet," as a substitute for natural cigar binders.

In manufacturing this material for binders, tobacco is ground into a fine powder, or flour, mixed with a cohesive agent, and rolled into a flat sheet of uniform thickness and quality. The moisture is controlled throughout all the various stages of the production, and the material is so made that not only have the taste and aroma of the natural leaf been preserved, but the burning quality has been improved.

The use of reconstituted sheet binder effects a substantial savings both in leaf and labor costs. Natural leaf binders have to be nearly perfect, and are therefore costly. When these are used, they are first stemmed, and the stems discarded. Generally each half of a stemmed leaf will yield two to three binder pieces and the trimmings go largely into the manufacture of scrap chewing, which is a lower value outlet for the leaf. In tobacco sheet, all the binder leaves are used, even though they may be broken or damaged, and the stems are not removed. There is no waste or trimmings in cutting the binder, as it is cut to a parallelogram shape, which uses all the sheet.

The savings in labor cost, as well as in leaf cost, is also an important factor in the development of this processed sheet for cigar-binder purposes. Natural binders must be hand-stamped and hand-fed into the cigarmaking machine but the sheet is fed automatically from a spool, thus reducing the required number of workers from 2 to 1 on most machines (fig. 43).

At present the sheet has only a very limited use as wrappers, but the potential saving in this area, also, is considerable, both in leaf and labor costs.

Nearly all cigars today are made by machine. The filler tobacco is first fed into a hopper to make the core or center part of the cigar. This filler may be made of long-shredded fragments of leaves, the length of the cigar, or of short-shredded pieces bunched together. The bulk of cigars today are made with short filler. The filler portion is blended and shaped, and the binder, either natural or sheet, cut and wrapped around it. Next, the wrapper is cut and applied and the end sealed. The finished cigar is finally checked by an operator. Machines can turn out cigars at the rate of 800 to 900 per hour.

Figure 43.--Modern cigar-making machine. The spool to the right is the reconstituted tobacco binder, and the operator is placing the natural wrapper on the cutting die.

In most handwork, by which a few of the high-priced cigars are still made, the filler part is blended and shaped, and wrapped with binder leaves. Then it is placed into the lower half of a mold block containing usually 20 individual molds the shape and size of the finished cigar. The upper half is placed over the mold block and held in position under pressure for several hours. The molded bunches are taken out one at a time, and the wrapper rolled on. Wrappers must be the finest of the tobaccos used in the cigars, of good color, and without imperfections. Each wrapper leaf, which has first been cut to the right size is wrapped spirally around the cigar, beginning at the base, and tapered off to form the head. The end of the wrapper is fastened with a gum paste, or similar material.

In making the very finest grade cigars, no form or mold is used. These cigars are entirely shaped, sized, and rolled by hand, on a specially made board or block fitted with a knife for clipping the bunch and the end. A high degree of skill and dexterity is required in making uniformly high grade handmade cigars.

Cigars are normally wrapped individually in cellophane. A large proportion are now packaged in "five-pack" cellophane-wrapped containers for handy merchandising by supermarkets, etc. However, many are still packed in boxes of 25's and 50's. Formerly the boxes were made exclusively of Spanish cedar, but most are now made of fiberboard. The cigars are carefully packed according to color shade, so that all packed together will have the same color.

About 23,000 persons are employed in cigar factories at the present time. Currently over 8 billion cigars are produced annually in the United States and Puerto Rico. (Imports of cigars amount to over 23 million.) Approximately 95 to 103 million pounds (farm-sales weight) of domestic leaf are used annually, and between 60 and 65 million pounds are imported. Cuba formerly was the most important supplier. The Philippines rank first now.

At the present time, around 143 factories manufacture chewing and smoking tobacco and snuff. Since 1918, when over 1,800 factories were operating, this branch of the industry has steadily declined, as consumer tastes turned more to cigarettes. Although the volume of snuff manufactured has remained practically the same over these years, production of the chewing and smoking products has dropped from around 450 million pounds to less than 150 million.

Chewing tobacco

The manufacture of chewing tobacco was at a high level for a long period up to and including 1918. Since that year, which marked the beginning of the most rapid expansion of the cigarette industry, this form of manufacture has steadily declined. All of the forms of manufactured tobacco that are classed as chewing are also used more or less for pipe smoking. The Internal Revenue Service classifies chewing tobacco into four kinds--plug, twist, fine-cut, and scrap.

Nearly all types of tobacco are used in the manufacture of chewing, even those that are primarily cigar and cigarette types, as well as those that are unsuited for use in either of these forms. Although both flue-cured and burley are considered cigarette types, both owe their early use to the chewing tobacco industry, and continue to furnish some leaf for the manufacture of these products. The dark air-cured and, to some extent, fire-cured types go into various chewing forms; and cigar leaf is the principal kind of tobacco going into the scrap chewing product.

Plug is made of leaf tobacco pressed into flat cakes after the stems have been removed. The plug consists of two parts, filler and wrapper. Fillers consist mainly of the heavier grades of flue-cured, burley, and dark air-cured tobacco, and some fire-cured. The wrappers are leaves carefully selected for fine quality and appearance. Various saucing compounds are added to the tobacco, such as licorice, maple sugar, honey, etc. Two distinct kinds of plug are made--one flat or thin and moderately sweetened, and the other thick and heavily sweetened.

Twist tobacco probably originated on the farm where the grower found it convenient to make his leaf tobacco up into twists for future use. Twist is similar to that product known as roll tobacco, which was the very earliest form of tobacco manufacture. In making commercial twist, the leaf is stemmed and twisted into small rolls and folded. Most twist is treated with the same kind of saucing preparations used for making plug, but some is left plain. One-sucker, burley, and fire-cured are the types of leaf used in the manufacture of twist. Hand labor is used to a large extent in making twist in the small factories located in producing areas, but it is manufactured by machine methods by larger firms.

Fine-cut tobacco, as indicated by the name, is made of finely shredded leaf, cut much the same as for the manufacture of cigarettes. However, some forms may be so finely cut as to appear coarsely ground, and these somewhat

resemble moist snuff. Some of it is heavily coated with saucing, like the thick plug. Burley and Green River are the principal leaf types used. Fine-cut is probably used as much for smoking as for chewing.

Scrap chewing, unlike most other chewing and pipe-smoking products, is made almost entirely of cigar-leaf tobacco. Cigar leaf used consists of "stemming" grades, or those not suitable for cigar manufacture. Practically all the stems and some of the coarser fibers are removed before processing. Scrap chewing is also an important outlet for broken leaves and "cuttings" from cigar manufacture. The product is essentially irregular fragments or flakes of tobacco leaf, about 1/2 to 1 inch in diameter, and put up in small packages. It is classified in the trade into sweet scrap (heavily cased with flavoring materials) and plain scrap.

Smoking tobacco

The term "smoking tobacco" commonly refers to pipe tobacco, although considerable quantities of tobacco so classified are used in hand-rolled cigarettes. Smoking tobacco is manufactured in many forms, such as granulated, plug cut, long cut, and others. Various types of leaf are used in the manufacture, but the most widely-used single type is burley.

Most smoking tobacco is treated by the addition of heavy saucing materials, which contribute to the mildness and aroma of the smoke and prevent too rapid drying out of the tobacco. However, some brands are only mildly flavored. The leading materials used for flavoring are tonka beans, the seeds of a tropical South American tree; and deer's tongue, the powdered leaves of the wild vanilla plant, a perennial herb that grows in pine barrens from North Carolina to Florida.

Granulated is one of the oldest and simplest forms of smoking tobacco. It is made mostly of burley and flue-cured types of leaf, but various blends are also used. The product consists of stemmed leaf broken into medium-sized flakes, with added flavoring. Some rolled, flattened, and cut stems may also be added. Granulated smoking tobacco is popular for hand-rolled cigarettes. This form of tobacco is usually packaged in small cotton bags.

Plug cut, (or cut plug), is made in much the same way as plug chewing tobacco, but no wrapper leaf is used. The stems are removed from the leaf, saucing compounds added, and the mass compressed into slabs. The pressed material is cut into thin slices, about 1/10-inch thick, which are packaged as slices. The leaf blends used for plug cut are similar to those used for making cigarettes. The main type used is burley, along with some Green River. "Bird's-Eye," a form of plug cut tobacco, is made by leaving parts of the stem in the leaf, and arranging the leaves in the cake to be pressed in such a way that the slices are made across the stems, producing the birds-eye effect. Other forms of plug cut are called cube cut, curley cut, straight cut, wavy cut, and others.

Long cut differs from plug cut in that the loose leaf is shredded before it is compressed into the cake. It is not cut as fine as fine-cut chewing tobacco. Long cut is used in high grade mixtures of smoking tobacco.

Smoking tobacco (except granulated) is usually packaged in tins or a combination of tin foil, paper, and cellophane.

Snuff

Snuff was made and used in America before the landing of Columbus. A century or more ago its use was considered one of the distinguishing marks of the gentleman. Snuff-taking enjoyed a degree of elegance for about 200 years, but in more recent times its forms of use and the classes of users have changed. Contrary to popular belief, very little snuff today is sniffed or used through the nose. Most of it is "dipped," a term commonly meaning that it is used in the mouth (tucked between the lower lip and the gum) as sort of a variation of chewing tobacco. Its use is probably centered among the laboring classes in the South, particularly Negroes, and the Scandinavian population in Wisconsin and Minnesota.

Production of snuff in the United States has never been large, but even today about 30 million pounds are still produced annually. Snuff is made principally from fire-cured; a small quantity of dark air-cured also goes into its manufacture. Some of the leaf is stemmed, but for the most part, the entire leaf is used and often additional stems are added.

After the leaf is aged, it is removed from the hogshead, cut into 1 to 2-inch pieces, and repacked for the "sweating" or fermentation process. After this period, it is dried, coarsely ground, and fed into revolving steel drums where rotary rollers reduce it to a fine powder. This product is then strained through cloth, flavored, and finally packaged, usually in small tin boxes.

Snuff is manufactured in many forms. Some of the principal forms are fine and coarse, dry and moist, plain and toasted, and salted, sweetened, flavored and scented. The different kinds are known by such names as Scotch (dry, finely-powdered, and variously flavored), Swedish and Copenhagen (coarser than Scotch and usually semi-moist), Strong Scotch (dry, with little or no flavoring), and others. Some of the essential oils and spices used for seasoning are cinnamon, cassia, attar of roses, wintergreen, mint, etc.

The chewing and smoking and snuff industry currently employs 5,700 production workers. In 1965, the following amounts of the different products were manufactured: chewing tobacco, 65.1 million pounds, including plug, 24.7 million; twist, 2.9 million; fine-cut, 3.7 million, and scrap 33.9 million; smoking tobacco, 71.8 million; and snuff, 29.7 million. A summary of the various types used in the different tobacco products is shown below (imported types are shown in parenthesis):

Product	Types used
Cigarettes	Flue-cured, burley, Maryland, (Turkish)
Cigars	Filler, binder, wrapper, (Cuban, Philippine Islands), some Maryland, fire-cured, and dark air-cured
Chewing tobacco:	
Plug	Flue-cured, burley, dark air-cured, some fire-cured
Twist	One Sucker, burley, fire-cured
Fine-cut	Burley, Green River
Scrap chewing	Cigar leaf
Smoking tobacco	Burley, flue-cured, dark air-cured
Snuff	Fire-cured, some dark air-cured

EXPORTS AND IMPORTS

INTERNATIONAL TRADE

Tobacco is produced and consumed in practically every country of the world and is one of the major items in international trade. World production was about 9.9 billion pounds in 1965. The United States is the leading producer. Among the other important producing countries are China, India, U.S.S.R., Brazil, Turkey, Japan, Rhodesia, Canada, Italy, Pakistan, Indonesia, Philippines, and Greece. Most producing countries grow more than one type of leaf, but must supplement domestic production by imports of other types in order to satisfy consumer desires. Some produce a substantial surplus and export large quantities, but are also extensive importers. The United States falls in this category. Some are virtually self-sufficient in tobacco. World exports now amount to about 1.9 billion pounds, roughly equal to one-sixth of total world production.

International trade in tobacco reflects consumer preferences for various kinds of tobacco products. As tastes in consumption changed over a period of years, so did demand for various types of tobacco. The popularity of snuffing shifted to pipe smoking and then to cigarettes. The change in need for leaf shifted accordingly from dark tobaccos to flue-cured, light air-cured, and Oriental types. The rise and fall of the chewing habit has had no effect on world trade, since it is a custom largely confined to America. This changing pattern of consumer preferences, and the resulting popularity of various types of tobacco greatly affected the geography of tobacco production on both a countrywide and worldwide scale. Of course international trade was affected also.

Governmental restrictions on international trade have continued to increase over the years, and now constitute the most important factor influencing such trade. The operation of government tobacco monopolies, tariff levels, import quotas, restrictions upon the use of foreign exchange, State trading, bilateral and compensation agreements, preferential duties, guaranteed markets, export subsidies, manipulation of currency exchange rates, and mixing agreements--all tend to limit the amount of leaf imported, and to channel imports from selected sources.

The United States has been the most important tobacco exporter throughout its history. Indonesia (formerly the Netherlands East Indies) for many years ranked second in exports due to the fine cigar leaf grown there, but exports have greatly decreased since the beginning of the Second World War. Rhodesia-Nyasaland and Canada are of fast-growing importance as flue-cured exporters. India remains important as an exporter of low quality flue-cured tobacco. Turkey and Greece are the major exporters of aromatic (Oriental) tobacco, and production and exports of these countries are increasing. Brazil, Cuba, the Dominican Republic, and the Philippine Republic are important exporters of dark and cigar leaf tobaccos.

The United Kingdom in the 1930's supplanted Germany as the most important leaf tobacco importer, and now takes about one-fifth of all leaf tobacco moving in world trade--mostly flue-cured for cigarette manufacture. Despite

considerable domestic leaf production, Germany remains the second largest importer. It is a major market for Oriental tobaccos, United States flue-cured cigarette leaf, and Indonesian and Brazilian cigar leaf. The United States is the third largest free-world importer of tobacco, largely Oriental leaf from Greece and Turkey, which is used in small percentages as a flavor ingredient in cigarettes. Cigar leaf imports--mainly filler--are also fairly substantial. The Philippine Islands now are the principal source of filler imports.

World trade in tobacco products is considerably less important than that in leaf, due largely to extreme protectionist policies of governments in favoring their own domestic manufacturers and labor. Cigarettes are the most important product moving in international trade, but the proportion is small compared with production, as most of the total world output is consumed in the producing countries. For example, the United States exported 23 billion cigarettes in 1965, which was only about 4 percent of the total produced.

UNITED STATES EXPORTS OF UNMANUFACTURED TOBACCO

Unmanufactured tobacco has been one of the leading agricultural commodities exported from the United States since the early days of the country. In colonial times the overseas trade in tobacco was so important that statistics on exports represent the only apparent record of production for the period from 1618 to 1788. Beginning with 20,000 pounds in 1618, exports permanently passed 1 million pounds in 1639; from 1664 to 1774, they ranged from 20 to more than 107 million; from then until 1814, they fluctuated widely, and it was not until 1851 that they permanently exceeded 100 million pounds. Since 1870, exports have never fallen below 200 million pounds, and since 1899, seldom below 300, and often above 500 million pounds. In recent years, approximately one-fourth of the total United States production has been exported. This volume now accounts for about 27 percent of world export trade in tobacco as compared with an average of around 43 percent in the 5-year period 1920-24.

The factor of predominant influence in the tobacco industry today is the steadily increasing consumption of cigarettes throughout much of the world. Its effects are apparent, therefore, not only in the increasing production of cigarette types of tobacco for domestic consumption, but in exports and imports of cigarette tobacco.

Tobacco from earliest colonial times has been one of the important export commodities, and is now exceeded in export value among agricultural products only by cotton and wheat, but the character of tobacco exported has undergone great change. Of the types of tobacco that enter into the domestic export trade, fire-cured probably led in production and exports during the 19th century and until about 1918. At about that time world consumption of cigarettes was making an extraordinary expansion. As a result, flue-cured tobacco increased rapidly in production and exports, whereas fire-cured entered into a decline that has continued almost without interruption up to the present time.

The United Kingdom is the leading export outlet for United States unmanufactured tobacco, but the total quantity and the percentage of total exports going to this country have declined in recent years. In addition to the United Kingdom, other important importers are the continental countries of Western

Europe, chiefly Germany, Netherlands, Belgium, Sweden, Denmark, and Switzerland. Considerable leaf is exported also to countries in other areas of the world, including Australia, Japan, Egypt, Ireland, New Zealand, and Thailand. Although China was an important market in previous years, exports to this country were discontinued when the present government came into power.

Figure 44.--Loading tobacco for export at a Norfolk terminal.

All types of leaf grown in the United States enter into the country's export trade, but three types (flue-cured, burley, and fire-cured) make up the bulk of it. Flue-cured leaf, used largely in the manufacture of cigarettes, is the predominant type exported, currently accounting for more than 80 percent of total leaf exports. Increased use of burley leaf in blended cigarettes in a number of foreign countries has been the primary factor resulting in a larger export demand for this type of leaf. In contrast with flue-cured and burley, exports of fire-cured leaf have declined sharply.

The principal export outlets, in approximate order of their importance, for the three kinds of leaf are as follows:

Flue-cured	Burley	Fire-cured
United Kingdom	West Germany	Netherlands
West Germany	Italy	France
Japan	UAR (Egypt)	Congo (Leopoldville)
Netherlands	Mexico	Belgium-Luxembourg
Australia	Portugal	
Belgium-Luxembourg	Netherlands	
UAR (Egypt)	Denmark	

Black Fat is a trade term applied to a tobacco form packed especially for export, but which has no domestic use. Most of it goes to the West African countries, chiefly Nigeria and Ghana; but small quantities go to the West Indies. It consists principally of One Sucker dark air-cured leaf, along with some Kentucky and Tennessee fire-cured. The tobacco is selected very carefully, particularly as to length, and tied into hands of 4 to 6 leaves each. It is sprayed with a mineral oil and other preparations almost to saturation, as it is being packed in boxes (cases), and subjected to tremendous pressure. The product is very dark. It is used mainly for pipe smoking by native populations, but in some areas in Africa, it is combined with pulverized nut kernels to make snuff.

Partly because the tobacco among some tribes serves as a medium of exchange, and partly because of fixed tastes and preferences of the consumers, the requirements of the trade are very rigid. They vary according to locality, but important considerations among them relate to the type or class of tobacco, quality, color, size of the leaf (both length and width), body (thickness), kind and percent of dressing, moisture content, number of leaves per head, number of heads per package or container, and size and shape of the container.

UNITED STATES EXPORTS OF TOBACCO PRODUCTS

The major manufactured tobacco product exported from the United States is cigarettes. Relatively small quantities of smoking tobacco, chewing tobacco, and cigars also go into the export market. United States cigarettes go into many foreign countries, among which the leading ones are Malaysia, Hong Kong, Netherland Antilles, France, Spain, Kuwait, Republic of Panama, Netherlands, Canary Islands, Paraguay, Italy, and Australia.

UNITED STATES IMPORTS OF UNMANUFACTURED TOBACCO

Although the United States is the world's largest producer and exporter of unmanufactured tobacco, it is also the third largest tobacco importing country in the free world (exceeded only by the United Kingdom and Germany). This is true because of the great demand in this country for certain specific kinds of foreign tobacco.

Cigarette leaf is the principal kind of unmanufactured tobacco imported, and the Oriental type, primarily used in the manufacture of blended cigarettes, makes up practically 100 percent of cigarette leaf imported. Most of it comes from Turkey and Greece, but small quantities are also obtained from several other countries. Cigar leaf types make up the remaining imports; these are mainly for filler but small quantities are also imported for use as cigar wrapper. Prior to the embargo imposed in February, 1962, Cuba had been the principal supplier of cigar leaf imports. The Philippine Islands now are the leading source, followed by the Dominican Republic, Colombia, and Brazil.

REFERENCE GUIDE FOR TOBACCO INFORMATION IN THE DEPARTMENT OF AGRICULTURE

Agency	Program responsibilities	Types of publications
Consumer and Marketing Service: Tobacco Division	Grading service, development of grade standards, training and demonstrations, market news, stocks report, Section 32 1/, Plant and Seed Exportation Act.	Market news reports (field) Market reviews (annually) Stocks reports (quarterly) Annual report on statistics
Commodity Stabilization Service: Tobacco Division	Acreage allotments and marketing quotas, price support, and other related production adjustment programs.	Statistical information on programs
Foreign Agricultural Service: Tobacco Division	Market development and promotion of exports, Public Law 480 2/, foreign production and competitive market developments abroad, statistics and analyses of exports and imports, Department representatives at international conferences.	Foreign crops and markets Foreign agriculture circulars (Foreign Tobacco (FT) series) Special reports
Economic Research Service: Economic and Statistical Analysis Division (Tobacco Section)	The Tobacco Situation, Outlook, and other special analyses.	The Tobacco Situation, Outlook, and special reports
Marketing Economics Division (Special Crops Section)	Tobacco marketing research, cost margins, and other special analyses.	Special reports
Farm Economics Division	Statistics and analyses of labor, power, and material requirements for production, curing, and marketing of tobacco	Special bulletins
Statistical Reporting Service: Agricultural Estimates Division	Estimates on acreage, yield, production, and price on tobacco; parity prices.	Crop report Agricultural prices
Agricultural Research Service: Crop Research Division (Tobacco and Sugar Crops Branch)	Research and testing concerning tobacco production, breeding, disease, and quality investigations.	Technical bulletins, Farmers' bulletins, USDA handbooks, material for extension circulars, State Experiment Station bulletins, scientific journals
Federal Crop Insurance Corporation	Insurance against crop failures for tobacco	

1/ Section 32 (of Public Law No. 320, 74th Congress, August 24, 1935, as amended) authorizes the use of funds from customs receipts for the diversion of agricultural surpluses by the expansion of domestic consumption and encouragement of exports.

2/ Public Law 480, Title I (The Agricultural Trade Development and Assistance Act of 1954) authorizes sales of surplus agricultural commodities for foreign currencies, and provides funds for development and expansion of foreign markets.

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